VOLUME V JUNE, 1914 NUMBER 6

THE JOURNAL OF EDUCATIONAL PSYCHOLOGY

A CHILD'S PROGRESS IN SPEECH, WITH DETAILED VOCABULARIES.

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I. Biographical.

The subject of this study is the author's little daughter, Jane. She was born at Tientsin, China, March 19, 1911. Eight months later, owing to unexpected developments in the Chinese revolution, she returned to the United States with her parents. Since then she has lived for short periods in California and Utah, while the last year she has spent in Montana.

Both her parents are college graduates, her father a teacher of chemistry, her mother a designer. In descent she is mostly English, since her father's nationality is English-Welsh, and her mother's English and Dutch-German. Jane is, however, in two lines the fourth generation to be American born.

She has lived continuously with her parents, the various homes always being in the city. She has not associated much with other children, but there is a sister in the family eight months old. Both have been systematically trained since birth, and are considered by most acquaintances to be models of deportment.

Jane has received no special instruction in acquiring speech. All attempts in that direction are encouraged, questions always being answered unless they are asked merely to pass time. No efforts are made to force her mentally. In this respect her

parents have resisted temptations to consider her any but an average American child, but lately several people teaching education and psychology have pronounced her decidedly above the average. At 28 months she correctly performed the Binet tests for three-year-old children, and also two of the tests for four-year-olds. In her speech and vocabulary, however, there are only a few things unusual. She has used some of the Montessori apparatus, learning to do the simpler problems quickly and correctly.

Physiologically, Jane is practically perfect. A rather severe attack of tonsilitis and a few minor childish ailments have been the only breaks in otherwise splendid health. At birth she weighed eight pounds and was 19 inches in height; at one year these figures were 22 pounds and 29.25 inches, respectively; at 28 months, when the second vocabulary was secured, they were 32.2 pounds and 35.5 inches.

II. Method of Acquiring Data.

The vocabulary for the first year was easily obtained. For the second the methods made familiar by Mateer, Pelsma and others were used. For two weeks at the beginning of the 29th month one or both parents were continuously with the child writing down, on papers prepared for the purpose, all that she said. The detailed vocabulary was later arranged from these slips. Other investigators have taken longer periods of time for observations—Mateer, ten weeks; Pelsma, three weeks; Rowe, ten weeks—but on the 12th day it was discovered that the only new words found on the slips were four or five in number which the parents were sure had been acquired since the beginning of the experiment. The same thing was true on the 13th and 14th days, and so at that time the observations were discontinued.

During the two weeks the child did not seem aware that her conversation was being watched more closely than usual, and indicated by her remarks that she thought the parents were drawing, a favorite pastime with her. She is quite talkative, and the vocabulary was thus easily obtained, most of the words obtained being used during the first week. Occasions were

made for her to use well-known words, and she was sometimes asked to name articles infrequently used or noticed by her. While some writers have objected to this method, it does not seem invalid to employ it. The word may be well known, but if no occasion arises it is not used by the child. A number of words used without a real understanding of their meaning have been omitted, as well as all words merely repeated after others.

III. Detailed Vocabularies.

In arranging the following vocabularies, simplification was the rule in deciding what words to set down. It is to be regretted that there is not greater unanimity of opinion among writers on this subject. Anything that will tend to keep the number of words at a minimum without sacrificing any important facts would clearly appear to be the best method. In accordance with this principle no proper names are listed in the vocabularies here presented; also no variants of verbs or adjectives nor plurals unless the singulars were not used. However, it is difficult to know where to stop in this weeding-out process, and the author has included all pronoun forms as well as a few variants of the verb "to be." The same word used in several senses is listed several times according to its grammatical use by the child. New words—that is, those acquired during the taking of the vocabulary—are italicized. Shortened words, etc., are in quotation marks.

Vocabulary at 12 *Months.*

Nouns—chow, daddy, dog, pot, toast.
Verbs—go, see.
Adjectives—pretty, good.
Interjection—hello.

Vocabulary at 28 *Months.*

A. **Nouns—apple, apron, arm.**
Verb—am.
Adjectives—a, all, awake.
Adverbs—all right, around, away.
Preposition—about.
Interjection—ah.

B. Nouns—back, bacon, bag, ball, basket, bath, bathroom, beans, bed, beet, bib, *bird*, *biscuit*, bite, blanket, block, book, bone, bottle, bouquet, box, bread, broom, brush, bucket, buckle, button.
Verbs—bite, break, brush, build, button.
Adjectives—beautiful, big, broken.
Adverbs—back, better, backward.
Interjection—boo.

C. Nouns—*cabinet*, cake, can, candy, car, carrots, cart, cascara, cat, cellar, chair, *chain*, charcoal, cheese, cherries, chick, chocolate, chow, clock, closet, clothes, clothes-pin, coal, coalshed, coat, cocoa, coffee, comb, cotton, cork, couch, crayon, cream, "crax" (crackers), *cube*, cup.
Verbs—can, can't, carry, clean, close, come, cook, cough, *crawl*, cry, cut.
Adjectives—chocolate, clean, cold, *crooked*.

D. Nouns—daddy, diaper, *dinner*, *ditch*, dog, doll, door, dress, drink, duck.
Verbs—dance, do, don't, draw, dress, drink, drop.
Adjectives—dear, dirty.
Adverb—down.
Interjection—darn.

E. Nouns—ear, egg, enough, eye.
Verbs—eat, excuse.

F. Nouns—face, feather, feet, fire, fish, floor, flower, fly, fork.
Verbs—fall, feel, *fit*, fix.
Adjectives—foolish, funny.

G. Nouns—garter, girl, glass, go-cart, "gran." (grandma), grass.
Verbs—get, go, gulp, gurgle.
Adjective—good.
Adverbs—good-bye, good-night.

H. Nouns—hair, hand, handle, "hankie" (handkerchief), hat, head, heel, *hole*, home, honey, house, horse.
Verbs—hang, have, hear, help, hit, hug, hurry, hurt.
Adjectives—heavy, high, hot, hurt.
Adverb—here.
Pronoun—him.
Interjection—hello.

I. Verb—is.
Pronouns—I, it.
Preposition—in.

J. Nouns—jacket, jar, jelly.
Verb—*jump*.
Adverb—just.

K. Nouns—key, kiss, kitchen, knee.
Verbs—keep, kick, kiss, knock.

L—Nouns—*lawn*, leg, lid, light, "lots."
Verbs—lay, laugh, lean, let, lie (recline), like, lock, look.
Adjectives—long, lost, lovely.
Adverb—lot.

M. Nouns—macaroni, man, meat, milk, mother, moon, mosquito, mouth, mouthful, mush.
Verbs—move, must.
Adverb—more.
Pronouns—me, my.

N. Nouns—"nakum" (napkin), neck, needle, nightshirt, nose.
Adjectives—nasty, naughty, new, nice.
Adverbs—no, not, now.

O. Verb—open.
Adjectives—old, one, other.
Adverbs—off, on, out, over.
Prepositions—of, on.
Interjections—oh, ouch.

P. Nouns—pail, pair, pan, paper, paste, pease, pencil, pie, piece, pillow, pin, plate, plenty, *plug*, pocket, pot, prunes, pudding, pup.
Verbs—pat, pick, play, put.
Adjectives—*pink*, precious, pretty.
Interjection—"plunk" (kerplunk).

R. Nouns—rabbit, *rake*, rattle, ribbon, rice, rocking-chair, rompers, room, rubber.
Verbs—rain, *rake*, reach, rock, run.
Adjective—ready.
Adverb—right.

S. Nouns—salt, salve, sandal, school-side, shirt, shoe, shovel, slipper, soap, socks, *sound*, soup, spoon, stair, step, sticker, stove, strawberries, string, suei'chow, sugar.
Verbs—say, see, sew, sit, shall, shut, sleep, smell, spank, spill, splash, stand, step, sweep.
Adjectives—silly, soaking.
Adverbs—so, some.
Pronoun—she.

T. Nouns—table, tablecloth, taste, tea, teeth, things, tie, toast, tongue, town, train, tray, tree, trunk, tub.
Verbs—take, talk, tear, thank, tickle, tip, try, *turn*.
Adjectives—that, the, thin, this, thirsty, *tin*, tired, two.
Adverbs—there, through, too.
Pronouns—that, this.
Preposition—to.
Interjection—there.

U. Noun—umbrella.
Adverb—up.
Pronoun—us.

V. Nouns—vase, vaseline.

W. Nouns—walk, washrag, water, wood.
Verbs—wake, walk, want, wash, would.
Adjectives—warmer, wet, white, wrong.
Adverbs—"wayup," what, where.

Pronoun—we.
Interjections—whoa, whoop.
Y. Adverb—yes.
Pronouns—you, your.

The following table shows the number of words of each initial letter classified as to grammatical form, the total number of words beginning with each initial letter, and finally, the total number of words in the above list:

TABLE I.

Initial.	Nouns.	Verbs.	Adjectives.	Adverbs.	Pronouns.	Prepositions.	Interjections.	Total.
C	36	11	4	0	0	0	0	51
S	21	14	2	2	1	0	0	40
B	27	5	3	3	0	0	1	39
T	15	8	8	3	2	1	1	38
H	12	8	4	1	1	0	1	27
P	19	4	3	0	0	0	1	27
D	10	7	2	1	0	0	1	21
W	4	5	4	3	1	0	2	19
L	5	8	3	1	0	0	0	17
R	9	5	1	1	0	0	0	16
F	9	4	2	0	0	0	0	15
M	10	2	0	1	2	0	0	15
G	6	4	1	2	0	0	0	13
A	3	1	3	3	0	1	1	12
N	5	0	4	3	0	0	0	12
O	0	1	3	4	0	2	2	12
K	4	4	0	0	0	0	0	8
E	4	2	0	0	0	0	0	6
J	3	1	0	1	0	0	0	5
I	0	1	0	0	2	1	0	4
U	1	0	0	1	1	0	0	3
Y	0	0	0	1	2	0	0	3
V	2	0	0	0	0	0	0	2
Q	0	0	0	0	0	0	0	0
X	0	0	0	0	0	0	0	0
Z	0	0	0	0	0	0	0	0
	205	95	47	31	12	5	10	405

Table II shows the percentage each part of speech is of the total number of words.

TABLE II.

	Nouns.	Verbs.	Adjectives.	Adverbs.	Pronouns.	Prepositions.	Interjections.	Total.
Number....	205	95	47	31	12	5	10	405
Per cent....	50.62	23.46	11.60	7.65	2.96	1.24	2.47	100.00

The next Table shows the number of words beginning with each initial sound (as contrasted in some cases with initial letter).

TABLE III.

Sound.	No. of words.	Sound.	No. of words.
K	50	th	12
B	39	ch	9
S	34	e	6
P	27	sh	6
H	27	j	5
T	26	wh	5
D	21	i	4
L	17	u	3
R	16	y	3
M	15	v	2
F	15		405
W	14		
G	13		
A	12		
O	12		
N	12		

Proper Nouns.—During the first year no proper names were used. At 28 months the following were observed:

Billie, Grand-ranch, Henry, Jane, Patsy, Percy, Puck, Roger, Rose, Sam, Squire.

If these were included in the vocabulary the total number of words would be 405 plus 11, or 416, of which the proper names would constitute 2.64 per cent.

IV. DISCUSSION OF VOCABULARIES.

Number of Words.—The number of words for the first year is about the same as the average of nine children so far reported. If the highest of these (twice as many as any other) and the two lowest are not considered, the average is still practically the same—Jane, 10; average of nine children, 9.5; average of six children, 9.2.

For the second vocabulary Tracy has reported two children of the same age. Their average was 564, considerably above 405. This author, however, includes inflected forms of verbs and adjectives. Of these, Jane used 72, thus bringing her total number of words to 477 if they are counted in. The average number of words used by seven children from 25 to 28 months old is 477, which also includes inflected forms. The average of 23 children from 24 to 28 months is 441. These are all the

observations now available except for three cases, where the totals for children two years of age are given as 1227, 1121 and 36. These were omitted as deviating too far from the average. The latter figure contains in some cases proper nouns, in others inflected forms, in some cases both. Jane's vocabulary of 405 words with neither of the above classes, of 416 with proper nouns, 477 with inflected forms and 488 as a maximum figure compares well with this average. Considering all the facts, the number of words in the vocabulary is, in all probability, close to that of the normal child of this age.

Number Vocabulary.—Numbers above two have been excluded from this list of words, since the child clearly did not comprehend their magnitude. Three was used indiscriminately for small numbers, while "lots" was used for larger quantities. This compares closely with other observations.

Color Vocabulary.—This embraces only two terms—pink and white—although the day after the experiment was finished brown was employed correctly. This was at least average; for some authorities state that the average child of two years knows only one color term, while many five-year-olds employ only four or five.

Parts of Speech.—In this respect the vocabulary is unusual, in that there is decidedly a larger proportion of verbs and adverbs and fewer nouns than found in any group of children reported. The adjectives, pronouns and interjections are also above the average, while the prepositions are about the same. Possibly some explanation of this may be found in the fact that Jane is very active, has been encouraged to do things herself for her own welfare and amusement, and likes to help her mother with anything on hand. The acquisition of terms for attributes of objects and actions shows some budding powers of observation also manifested in other directions.

Coined Words.—Most observers report a number of these expressions, together with unusual deviation from the dictionary or grammar, but in this list not one is to be found unless it be the expression "wayup." This does not result from a lack of imagination, as some authorities appear to consider, but from the fact that much care is exercised to see that the child both acquires and pronounces its words correctly. Instead of

the household using quaint expressions and thus fixing them in the child's memory, no attention (publicly at least) is paid them. The word "heavy" for some time was used to express the ideas of heavy, difficult and hard. If the Montessori forms did not fit easily they were "heavy;" if the door stuck, it was "heavy;" the putting away of the playthings was once said to be "heavy," too. But this can scarcely be said to deviate from common usage, and shows how easily words may be applied in a figurative sense even by a little child.

Objectionable and Non-grammatical Words.—In the first category only one word appears—the exclamation "darn." It is not known who was the guilty party, but the child has used it several times with much vim. Under the second heading there is to be noticed a confusion between the verbs "lie" and "lay," which no doubt is natural enough. Several shortened and mispronounced words will be discussed later.

Foreign Words.—Two Chinese words and one Pigeon-English expression are to be found in the list. The former, "chow" and "suei'chow," mean food and sleep, respectively. The latter, "school-side," is self-explanatory. These came from Jane's oriental experiences!

New Words.—Those acquired during the period of observation were 20 in number, or 4.93 per cent. of the whole.

V. The Acquisition of Speech.

A large number of writers, both scientific and otherwise, have ascribed to the baby's first cry the expression of various emotions, both poetical and prosaic. Pain, indignation, grief, surprise, are some enumerated. In Jane's case this first beginning at self-expression was a series of short, rapid, vigorous cries continued for about one minute. Judging by later samples, this cry was most like that which later warned her mother of some general discomfort, such as coldness. Contrary to the contention of some writers that all very small babies "sound alike," Jane's voice had a very distinctive timbre, being low pitched and full in tone. It was easily distinguished from the voices of other children.

For the first few days all the crying was of much the same character as the first cry, but by the end of the second week her parents could distinguish several different varieties. Pain was expressed by high, sharp yells, forcefully uttered; hunger by much the same cry, but pitched in a lower and milder key; general discomfort or discontent was shown by intermittent cries. The child developed a dislike for hearing paper rattled, and expressed this by a definite vocal performance. At about the same time every day she indulged in an "exercise cry," during which she tried various pitches and modes of utterance, generally rather vociferous. Later a cooing, singing style was adopted to show general satisfaction with things.

When about two months old she began to "talk," using in rapid succession a great variety of sounds. These began with "a" and "o," to which easy consonants such as "b," "d" and "m" were soon prefixed. The latter sounds were then doubled into "mama," "dada," etc., and then strung together in long chains. It was evident that the child was experimenting, and enjoyed doing so. During the course of the next few months practically all the sounds in the language were heard by the parents. A favorite pastime of the child was the stringing together of the combination, "doglely-oglely-woglely" to form many variations.

Conscious imitation was first shown during the seventh month. This was at that time only applied to sounds and gestures, while it was not until the ninth month that any but very simple words were attempted. At first it was plain that only imitation was at work, and the child was ten and one-half months old when the first word was spontaneously used in such a way as to show that to it was attached some meaning. The word was "hello," usually repeated four times in rapid succession. The child was greatly pleased with this performance, beginning her salutation when people were some distance away.

From this time on words were slowly, but surely, acquired. At the end of the twelfth month 10 words were in constant use; at 15 months it was estimated that this number had increased to 75; at 18 months, to 175, and at 28 it had reached the total here shown, 405.

No definite plateau stage was observed, such as was noted by several authors. After the eighteenth month a very rapid increase in the vocabulary was remarked, but at no time was interest in acquiring speech almost or entirely absent, since almost every day a new word would be used. Jane did not walk until she was 18 months old, when she suddenly learned to do so in one evening between 6 and 9 o'clock. She was so infatuated with the new accomplishment that she practised it until quite exhausted, staying up beyond her usual bedtime to explore new parts of the house. The next morning she started out walking, and has not crawled a foot since. Perhaps this is why no plateau was clearly marked in the child's speech development. But, as remarked above, at the same time as the walking was so suddenly acquired there was a great enrichment of the vocabulary, so perhaps some assimilative process had been at work.

VI. Methods.

Fully as interesting, and perhaps more valuable, is information as to how the child gains materials for expression. In the present case the child passed through several well-defined stages, finally employing an original method for learning sentence structure which was justified by results.

At first, while the imitative period was in progress, Jane would repeat many of the words she heard, saying the same word over and over to perfect pronunciation.

At 15 months, however, this practice was discontinued entirely. Nothing now could induce her to repeat new words; they were listened to in silence. Nevertheless, there was a constant use of expressions unused before. Apparently the child was carefully observing, assimilating, and when opportunity presented, using the new words correctly and with distinct enunciation without any practice. Frequently the parents were startled at hearing some word they had forgotten having used. During this time the use of two Chinese words was also discontinued, whereas before they had been among the most worked. No other words were dropped in this way. Did the child perceive some difference between these and the English

vocabulary and consciously avoid them, or was this and the failure to repeat signs that a plateau was then being crossed? At any rate, after the eighteenth month Jane once more repeated any combination of words she heard, at the same time using freely once more the tabooed oriental phrases.

While first learning to talk there was shown a tendency to generalize. Thus "dog" was applied to any animal from a hen to a cow, even to a horse and wagon, together or singly. Motion seemed to be the quality linking all these together. Later, "dog" was used as a sort of class name for animals, the correct term, cat or pig, being used concurrently. At last the word was restricted to its proper sense. This progress occupied about three months. In the same way boys, men, teddy-bears and a red fire hydrant were called "girls," but the incongruity here was perceived more readily than in the dog case.

At the time of writing, "girls" was the term used for anything feminine from six to sixty. This trait of generalization has been noticed by a number of observers.

Some words the child would or could not learn, though they appeared no more difficult than many easily acquired. Perhaps growing independence or a spirit of contrariness was at work. In one case somebody laughed at her pronunciation of a certain word, which caused it to be cast out bodily from the vocabulary. An interesting word in this connection is "yes," which is used but seldom. The negative in all forms was early and easily learned; indeed, some days all suggestions offered were vetoed. "Yes" was first used much later, and is now avoided, certain circumlocutions taking its place.

In this building up of the vocabulary the parents aided as much as possible by never talking baby-talk; also by consistently giving each thing its right name. In this respect, however, the father did not always have the courage of his convictions, for although the child easily learned to say cube, and later, cylinder, the father did not quite venture upon polyhedron or parallelopiped.

During the twenty-first month simple sentences of a few words were first used, although previous to this it was evident that one or two words constituted to the child a complete

thought. Two months later more ambitious sentences were in service made up of all parts of speech except conjunctions. The latter were not used even at 28 months. At the beginning of the twenty-fourth month a new development appeared, which at first was decidedly puzzling. Although talking more than usual, the child suddenly became all but unintelligible, only a sensible word here and there lifting its head above the stream of meaningless nonsense. In a few days it was noticed that this babble was divided into parts, each ending with a full stop, an exclamation or interrogation point; also that a great variety of expressive inflections and turns of the voice acted as an accompaniment to the apparent nonsense sounds. It was then obvious that the child was imitating conversation,—which its performance closely resembled if heard from a distance. This idea was confirmed when guests were present, for the child, adopting the proper social tone, joined in the conversation with beautifully modulated periods quite devoid of meaning. It was then mortifying to the parents, who remembered the former rapid progress, to hear the visitors say: "She doesn't talk at all yet, does she?"

This lasted nearly two months, and then the value of it all appeared. Out of the chaos of sounds there emerged complete sentences with all parts in good order, with emphasis and inflection correct, the whole colored with some of the individual expression which distinguishes one person's conversation from another. The remarks of visitors were now more gratifying than before. The child has not since reverted to the more primitive sentences.

There remains only to mention the progress in enunciation. Regarding this there is little to say, since Jane has always spoken distinctly, and only a few combinations have presented any difficulty.

The "pk" in napkin refuses to be conquered. Handkerchief is shortened to "hankie." The "v" in shovel has a tendency to become a "b." If initial sounds only are considered, the least difficult sounds for Jane are K, B, S, P, H, T. This order closely approximates that of several observers. Only one word has a history of several changes. This is "book," which was acquired very early as "gook." When attempts were made to correct this it became "cook," but shortly relapsed into "gook" again, which is used along with the correct form.

VII. Mind Content.

An attempt was made to find what the child had stored in its mind concerning the words in its vocabulary. But with questions as "What is a cart?" Jane did not understand what was wanted. To all such she would either repeat the question or the noun, or else go to the object and say, "Here it is." The same questions in different forms fared no better. To most questions intelligent replies were given, but they showed only associative memory.

VIII. Conclusion.

The author has already on hand a record of the progress made along these lines by the youngest member of the family, and is continuing observations on both children. It is hoped that these notes may contribute something to the knowledge of the psychology of language development, a study which may perhaps be based mainly upon its genetic aspect.

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THE EFFECT OF PRACTICE UPON VISUAL APPREHENSION IN SCHOOL CHILDREN. PART I.

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(*Studies from the Cornell Educational Laboratory, No.* 19.)

OUTLINE.

Summary.
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    1. Miss Aiken's work.
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    12. Effect of drill on school work: the problem of transfer.
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IX. Conclusions.

SUMMARY.

This experiment supplements the previous attempts of Whipple and Foster to examine by scientific methods the remarkable results alleged by Miss Catherine Aiken to follow the use of formal exercises in visual apprehension ("mind training").

Twenty-nine 2d-grade public-school pupils, of both sexes, were given daily for 17 weeks a ten-minute exercise in the rapid observation and reproduction of various visual materials—letters, digits, words, geometrical figures, etc.

The chief results are: (1) the improvement from drill is rapid at first, then slow, save that (2) the group of children classified as "poor" made a slower and more prolonged improvement by which they ultimately came to surpass the group classified as "medium." (3) The effect of the drill seems to be clearly persistent even after 41 weeks of no practice. (4) University students, tested without special practice, are superior to 2d grade pupils with 3 months' practice, though the best group of pupils surpasses the poor group of students. (5) Boys surpass girls and men surpass women in visual apprehension. (6) There is a direct, though small, correlation with age. (7) Individual differences are marked. (8) There is a distinct correlation between ability in visual apprehension and school standing. (9) In the term following this drill work there was a striking general rise in the school grades of the pupils, seemingly due to the formal drill exercises. (10) A special test by the *Aussage* method (Binet's card-of-objects) showed that the practiced children were superior in recall and description to their unpracticed schoolmates when tested some 50 weeks after the termination of the special drill.

I. INTRODUCTION.

1. *Miss Aiken's work:* In 1896 and 1899 Miss Catherine Aiken published accounts of specific mental exercises which she conducted with her pupils at a private school for girls at Stamford, Conn., and which were designed for the purpose of mental training in the "concentration of attention and memory."[1]

The plan which she "marked out for her own use in the quickening of the mental activities was as follows: First, to

[1]CATHERINE AIKEN, *Methods of Mind-training.* New York, 1896. Pp. 75. For supplementary exercises, see also her *Exercises in Mind-training.* New York.

quicken the perceptive faculties; second, to cultivate the habit of accuracy in seeing and hearing; and third, to discriminate by immediately observing similarities, differences, and relations, remembering always that attention was the underlying condition for the proper development of these functions of the mind'' (page 24). She sought to accomplish these ends by appealing to innate curiosity, for the most part through the sense of sight. Her method consisted in placing a number of numerals, letters, words, figures, etc., of varying complexity upon the reversed side of a revolving blackboard, which, upon a given signal, was quickly turned about. When the ability to recognize simple material at a single glance had been attained, more complex material was given. As an illustration of the more complex material a single example will perhaps suffice. Upon the revolving blackboard the following numbers were placed in a vertical column: 692, 18, 95, 225, 9000, 470, 6000, 25. By rotating the board these figures were exposed for three seconds, and the pupils were asked but once to square the second number, subtract 200 from the fourth, multiply the fifth by three, and extract the square root of the last number, and then to repeat the changed column, which they did, as follows: 692, 324, 95, 25, 27,000, 470, 6000, 5 (page 31).

The results that Miss Aiken sets forth in these books are extraordinary. ''So extraordinary,'' to quote Professor Whipple,[2] ''as to challenge attention both from psychologists and educators, for, if it be possible, by devoting ten or fifteen minutes daily to simple exercises, to accomplish the results which are claimed, it would appear to be incumbent upon all teachers to institute such exercises and to regard them as a very essential part of schoolroom training. If, on the other hand, Miss Aiken's results cannot be duplicated, it is equally important to establish this fact and then if possible to find out the cause of the discrepancy.''

2. *Whipple's experiment:* With the idea of subjecting Miss Aiken's assertions to careful test under laboratory conditions, two investigations have already been made in this laboratory. In the first of these Professor Whipple sought to

[2] G. M. WHIPPLE, *The Effect of Practice upon the Range of Visual Attention and of Visual Apprehension.* This JOURNAL, 1: 1910, 249-262.

measure the extent, and to analyze the nature of the improvement due to practice in visual apprehension. Two sets of experiments were conducted by him. In the first set, *i. e.*, experiments on range of attention, five- six- and seven-place series of isolated letters were exposed with a tachistoscope for 0.08 second. Six college students were the observers. The quantitative results agree in general with those of other investigators in this field. Whipple found that the average range of attention was between four and five impressions; that practice has but a very slight effect, which is explicable in terms of habituation to the experimental conditions and of the development of "tricks and schemes of grouping," and that the range of attention itself is not affected by practice. In his second set of experiments, *i. e.*, those on the range of apprehension, groups of dots, pictures, drawings, nonsense-syllables, and stanzas of poetry were exposed for three seconds with the tachistoscope, and collections of ten objects were exposed for six seconds. Three adults served as observers in this part of the experiment. The results agreed with those of the first set. The effect of practice was negligible when adaptation and assimilative devices were eliminated. A qualitative analysis showed that the performance was conditioned by "native capacity, degree of attention, specific capacity for given types of material, ease of assimilation of the material shown, 'obstruction' or distraction, ideational type, voluntary restriction of observation, and grouping" (page 250).

3. *Foster's experiment:* In the second investigation of this problem from the Cornell laboratory Mr. W. S. Foster[3] supplemented Professor Whipple's study. His object, to use his words, was "to measure the observers' initial and final ability to represent to themselves in image, impressions recently given in sensation, and to discover the factors or processes concerned in observation and reproduction, together with their relative importance" (page 12). His observers were all trained psychologists, and emphasis was placed upon qualitative, as well as upon quantitative data. His method was of the same general character as that employed by Professor Whip-

[3] W. S. FOSTER, *The Effect of Practice upon Visualizing and upon the Reproduction of Visual Impressions.* This JOURNAL, 2: 1911, 11-22.

ple and as that recommended by Miss Aiken. His results agree very closely with those of Professor Whipple. He finds that the increase in the ability to reproduce the material occurs very soon in the course of the experiment, and that this increased ability is dependent upon the particular material, time, instructions, and other conditions of the experiment, upon familiarity with these conditions, and upon confidence, based upon familiarity. In conclusion he says (page 21): "That training in these experiments has made the observers noticeably better observers or memorizers in general, or given them any habits of observing closely or reporting correctly, or furnished any ability to meet better any situations generally met with, neither we nor any of the observers themselves believe. It seems, therefore, as if the value of formal training of our kind had been greatly overestimated. However, our experiments were made upon adults who were already trained in habits of attentive observation, and we have no right or wish to extend our conclusions in wholesale fashion. It may be that for *immature* or *untrained* persons practice in visual reproduction might possess a general value that was not discovered under our conditions." Professor Whipple remarks similarly: "It may be admitted at the outset that the negative outcome of these experiments is not entirely conclusive; it may be objected that practice was not sufficiently long; it may be objected that our observers were adults, and that the outcome would have been essentially modified had our tests been applied to children." In a footnote to the same study (page 249) he further says: "It was the author's intention to withhold publication until the tests could be repeated with school children. As circumstances have conspired to render this impossible, the results are now published with the hope that other investigators may undertake similar tests with children."

II. The Problem

We thus have our problem before us. It is our purpose, though using virtually the same material, to apply the drill exercises to children instead of adults, and to continue them for a much longer period than that used by either Whipple or

Foster.[4] We are desirous of learning what would be the effect of a daily drill for fifteen minutes conducted during a period of seventeen weeks; and whether the results of this practice would support the conclusions of Whipple and Foster; or whether, after, all, Miss Aiken's reports were well founded. It will thus be seen that our aim was to supplement further the two studies previously made in this laboratory by applying the drill for an extended time to children. Of course, from the nature of the case, since our observers were children, no introspective reports could be taken. Our results are, therefore, entirely quantitative, and for their interpretation we must needs refer to the two earlier studies.

III. Subjects

The subjects were the school children in the second grade of the East Hill School in Ithaca, New York.[5] The ages of the children ranged from 7 to 10 years. In all, 35 children took the tests, but on account of irregular attendance[6] the data of 29 only were considered in the final computation. Of these 29, 11 were girls and 18 boys.

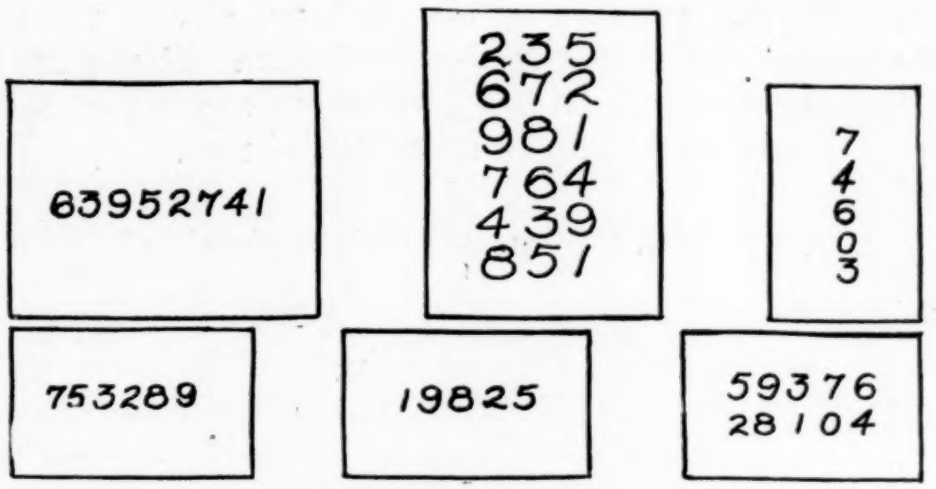
IV. The Material

Seven types of material (see Plates I and II) were used in the tests, namely (1) numerals, (2) letters, (3) combined numerals and letters, (4) words, (5) combined numerals, letters and words, (6) geometrical figures, and (7) various materials—numbers, letters, figures, etc.—arranged in a frame composed of two pairs of parallel lines crossing at right angles at

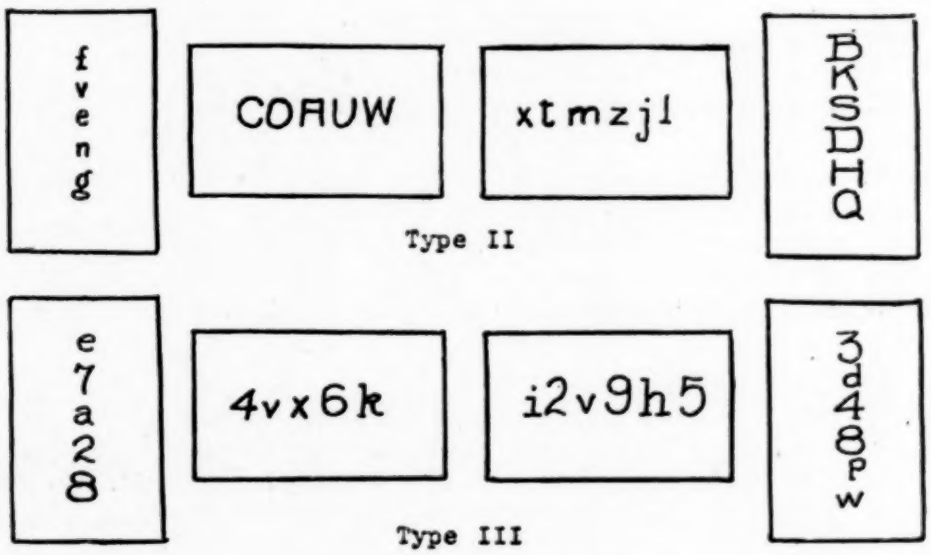
[4]Miss Aiken used from fifteen to twenty minutes a day for an indefinite length of time. Whipple used an hour a day in the experiments on the range of attention until 124-250 exposures had been made, and in the experiment on the range of apprehension he used three hours a week for seven weeks. Foster used from three to five hours a week until 30 series had been given.

[5]We wish to take this opportunity to thank Superintendent Boynton of the Ithaca schools for the privilege of conducting the experiment, and also for permission to make use of the school records of the pupils.

[6]Three of the thirty-five children moved from the school district before the tests were completed, two others moved into the school district and joined the class in the middle of the term, and one child was absent so frequently, more than one-half of the time, that we thought it advisable to leave him out of consideration.

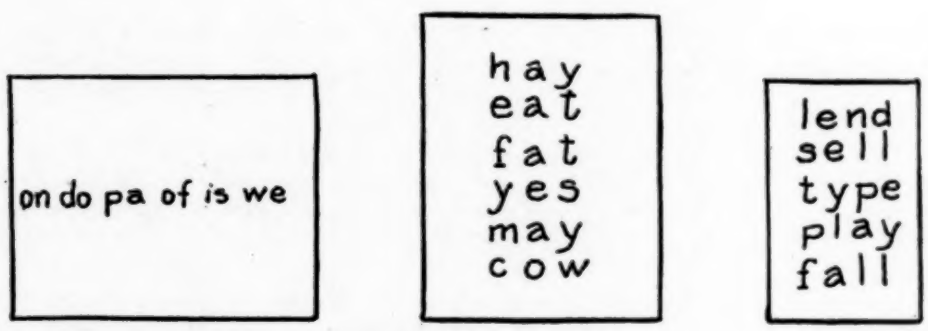


Type I



Type II

Type III



Type IV

Plate I.

their centers, forming what is commonly called a 'tit-tat-to' frame. These seven types were further subdivided into 40

distinct subtypes, ranging within each type from the simple to the complex, as shown in the list below. In the first five types the units (digits, letters, etc.) were sometimes set in a vertical column, sometimes in a horizontal row.

List of the various types and subtypes of material.

I. NUMERALS.

1. One five-place number (vertical).
2. One five-place number (horizontal).
3. One six-place number (vertical).
4. One six-place number (horizontal).
5. One seven-place number (vertical).
6. One seven-place number (horizontal).
7. One eight-place number (horizontal).
8. Two five-place numbers (horizontal).
9. Five two-place numbers (vertical).
10. Six two-place numbers (vertical).
11. Five three-place numbers (vertical).
12. Six three-place numbers (vertical).

II. LETTERS.

13. Five letters (vertical).
14. Five letters (horizontal).
15. Six letters (vertical).
16. Six letters (horizontal).

III. COMBINED NUMERALS AND LETTERS.

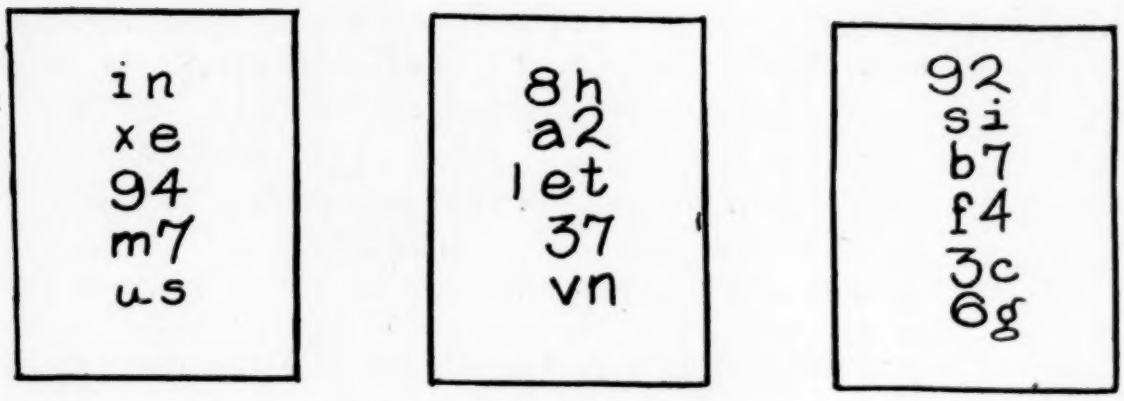
17. Five units (3 numerals and 2 letters, vertical).
18. Five units (2 numerals and 3 letters, vertical).
19. Five units (3 numerals and 2 letters, horizontal).
20. Five units (2 numerals and 3 letters, horizontal).
21. Six units (3 numerals and 3 letters, vertical).
22. Six units (3 numerals and 3 letters, horizontal).

IV. WORDS.

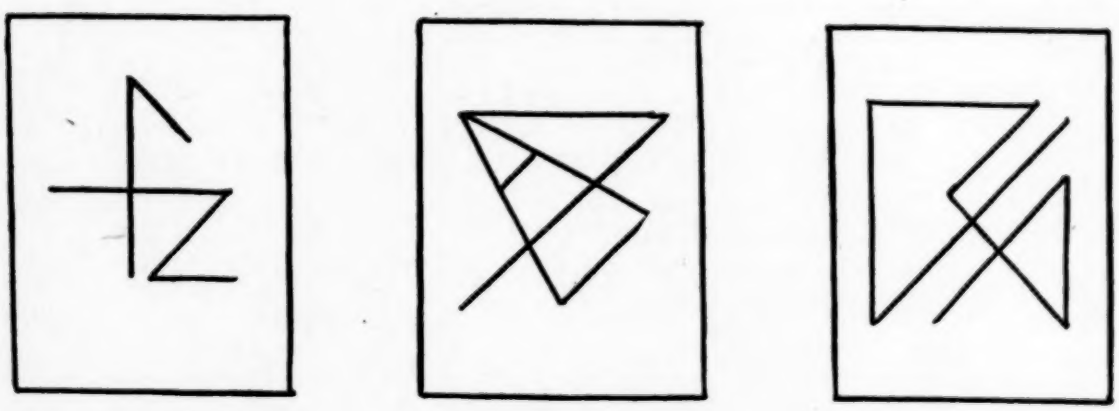
23. Five words of two letters each (vertical).
24. Five words of three letters each (vertical).
25. Five words of four letters each (vertical).
26. Five words of two letters each (horizontal).
27. Six words of two letters each (vertical).
28. Six words of two letters each (horizontal).
29. Six words of three letters each (vertical).

V. COMBINED NUMERALS, LETTERS AND WORDS.

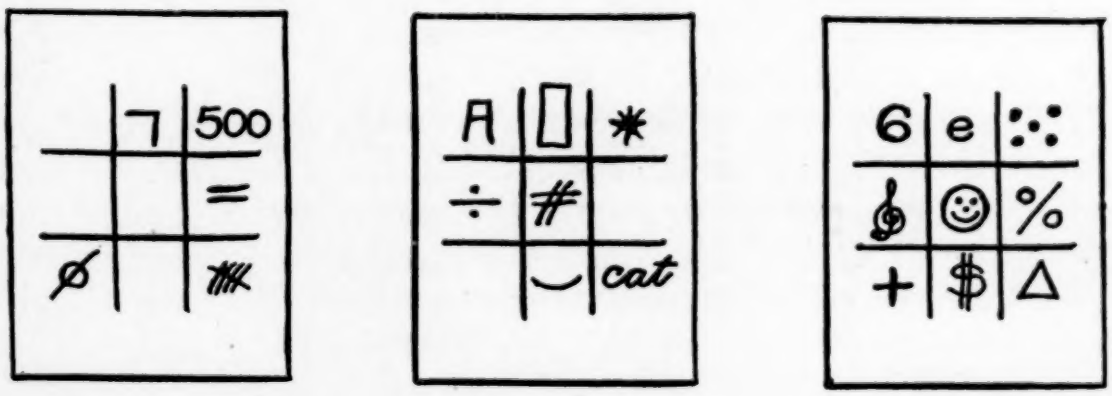
30. Five components (2 two-letter words, 3 numerals and 3 letters, vertical).
31. Five components (1 three-letter word, 4 numerals and 4 letters, vertical).
32. Six components (6 letters and 6 numerals, arranged miscellaneously in column of twos).



Type V



Type VI



Type VII

Plate II.

VI. Geometrical Figures.
- 33. Five lines.
- 34. Six lines.
- 35. Seven lines.

VII. Various Characters in Frame.
- 36. Five characters arranged miscellaneously.
- 37. Six characters arranged miscellaneously.
- 38. Seven characters arranged miscellaneously.
- 39. Eight characters arranged miscellaneously.
- 40. Nine characters arranged miscellaneously.

All of this material was printed by hand with India ink upon sheets of heavy white cardboard, in size either 11x14 inches or 14x22 inches. The figures, letters, and other characters upon the cardboard were at least two inches in height, and were printed in block style so as to be easily read. With the letters both capitals and lower case were used.

V. Plan of the Experiment

The main experiment began on the fifth of February, 1912, and ended on the third of June. From February 5 to the first of May the tests were given to the pupils directly after the noon recess. The first fifteen minutes every afternoon were thus occupied. From May 1 on the period of practice was changed to the last fifteen minutes of the day's work, *i. e.*, from 4.15 to 4.30. This change was due to an unavoidable alteration of the daily program. Two of Ithaca's schoolhouses were destroyed by fire within a few days, and only half-day sessions were held in each grade. In our building the rooms were given over to other pupils in the morning and the class we were testing held a single four-hour session in the afternoon. Three practice days were lost during the readjustment to the new conditions. Beside this, the week's vacation at Easter, and two holidays (Washington's Birthday and Decoration Day) were unavoidable interruptions to an otherwise regular series.

Nearly a year later the experiment was repeated. Of the 29 subjects who took the original Drill and Test Series, there were but 19 left. The work lasted one week, from the 10th to the 15th of March, 1913, and was conducted directly after the noon recess. As before, ten cards were exposed each day.

The experiments were conducted by the teacher,[7] who stood directly in front of the class and displayed the cards to the pupils by hand. A silent metronome adjusted to swing in seconds was placed behind her desk, so as to be visible to her, but concealed from the pupils. After the preparatory signal, "ready, one, two, now," there followed the exposure of the stimulus-card, which lasted five seconds. Immediately after the exposure the pupils individually reproduced upon prepared paper as much as they could remember of the card which had just been displayed. Ten such stimulus-cards were shown in each series, and one series was given, save for the interruptions before mentioned, on each school day throughout the entire period of 17 weeks in all, then 76 series were presented to the children.

Before exposing the cards of Type VII, the teacher always indicated to the pupils that such a card was next to be shown, and instructed them to draw the 'tit-tat-to' frame upon their papers. When this had been done the exposure was made in due form.

The children were instructed not to repeat the material aloud. At first it was very hard to overcome this tendency, for the children seemed involuntarily to repeat the numbers, letters and words as they were presented. Though this has been found greatly to facilitate reproduction, it was forbidden, because the children would start to read the cards in unison, but some would read rapidly, others slowly. Rather than to work an injustice upon the good pupils by making them delay for the poorer pupils, we chose this method of eliminating the difficulty.

The experiment lasted 18 weeks. In order to trace the effect of the drill, we have divided the work of these 18 weeks into nine periods—a preliminary period of fore-practice, five test-periods and three drill-periods. It will be obvious that the exercises during the test-periods contributed to the practice-

[7]We are under decided obligations to the teacher, Miss Helen M. Gleason, for her interest in the problem, for her aid in giving the tests, and for her unfailing devotion to the work. She secured and held the children's interest throughout the exercises. We also wish to thank Miss King, who conducted the experiment during Test-Series E.

effect as well as those of the drill-periods proper; the distinction is made merely from the point of view of the statistical treatment of the data.

During the first week of fore-practice the material presented was in the main comparatively easy; only one difficult exposure card was presented each day. This week's work was not computed in conjunction with the rest of the data, for we wished to give the pupils a week's time to become accustomed to the work, to understand what was wanted of them, and to learn how the tests were conducted. The data for this fore-practice period, however, were retained and were used for classification of the pupils into certain groups, as will be explained in due time.

During the second week a test-series, which we shall call *Test-Series A,* was given. This series was composed of the most difficult cards of each type that we had at our command.

During the next four weeks, *i. e.,* from the third to the sixth week, inclusive, a long practice-series was given. This series will be spoken of as *Drill-Series* 1. It consisted of comparatively simple material which gradually, day by day, became more and more complex.

In the seventh week *Test-Series B* was presented. This test series was composed of exactly the same number of elements and kinds of materials as *Test-Series A*. It was, in fact, formed by the inversion of the material in *A*. Thus, with the figures, letters, and numerals, the order was reversed: what was at the head of the line was now placed at the end; what was at the top of the column was now placed at the bottom. With the words the order was changed. The geometrical figures were revolved through an angle of 180°. The same characters were retained in the frame, merely in an altered position.

During the next four weeks, *i. e.,* the 8th to the 11th week, inclusive, *Drill-Series* 2 was given. This period was interrupted by the Easter vacation, so that it embraces only three weeks of exercises. This series, like *Drill-Series* 1, gradually and steadily increased in difficulty.

At the end of this second drill-period, *i. e.,* in the 12th week chronologically, *Test-Series C* was employed. This test-series

was exactly the same as *Test-Series A*. The same cards were used as had been employed ten weeks before.[8]

During the next four weeks, *i. e.*, 13th to 16th, inclusive, *Drill-Series* 3 was given. This series was more difficult than any that had preceded, and it also continued to increase in difficulty, until, during the last week of this period, the material was practically of the same difficulty as that of the test-series.

After this series, and during the last week of the main experiment, *Test-Series D,* which was an exact duplicate of *Test-Series B,* was given.

Ten months later, in the 58th week after the beginning of the experiment, *Test Series E,* which was an exact duplicate of *Test-Series A,* was given to the children of the third grade. There were 31 children in this grade, 19 of whom had received the training of the previous year. All of the children, however, took the test and later a comparison was made between the children who had been trained and those who had not.

A supplementary experiment, which will be explained later, was introduced in the 66th week. The entire plan of the experiment may then be summarized conviently as follows:

Week.	*Work.*
1	Fore-practice.
2	Test-Series A.
3-6	Drill-Series 1.
7	Test-Series B.
8-11	Drill-Series 2.
12	Test-Series C.
13-16	Drill-Series 3.
17	Test-Series D.
58	Test-Series E.
66	'Aussage' Test.

VI. Method of Grading Data.

No scoring was done until the entire experiment was finished. The experiment was ended in June; the data were graded in September, and by the following method:

[8]This procedure might be criticized on the ground that memory of Test-Series A would aid in the second reproduction, Test-Series C. We, however, do not regard this objection as serious, because a long interval had elapsed between Series A and Series C, and because a large amount of similar material had been presented, memorized and reported during the interim. As a matter of fact, the children were asked during the presentation of Test-Series C whether or not they had ever seen any of the cards, and all answered "no." The value of using the same material is clear enough; it permitted direct comparison from one test period to another.

With materials of Types I, II, III, V and VII one unit was credited for every character correctly reproduced, and 0.5 was deducted for every error of transposition or insertion, *e. g.*, i2v95h or i2v9h35 for i2v9h5 was scored 5.50.

With materials of Type IV one unit was credited for every word correctly reproduced. For every error of transposition or insertion, a fractional part of the whole was deducted; in words of two letters, 0.5; in words of three letters, 0.3, and in words of four letters, 0.2 was deducted.

With the material of Type VI, the geometrical figures, one unit was given for every line correctly drawn, and 0.5 was deducted for every incorrectly drawn line.

The data for every observer for each day throughout both the test-series and the practice-series was thus computed.

From the data of the first week, which we have designated as the period of fore-practice, the observers were divided into three Classes—I, II and III—on the basis of their average score during this week. These classes may be regarded as composed of good, medium and poor observers, respectively.

The test-series were given five times—four times at intervals of five weeks, and once at the end of a year. In the computation of the data of the first four test-series, *A*, *B*, *C* and *D*, all the series were made homogeneous, *i. e.*, if a certain pupil was absent on the first day of any one of the test-series, then the performance of this pupil on the first day of the other series was also omitted from consideration. In the computation of the results of the three practice-series this precaution to standardize the data was, however, not taken, for the material was never the same in respect to the number of elements in a day's series or in respect to the difficulty of the series. In the computation of the data of *Series E* the averages were figured directly from the individual scores at hand. No effort was made to standardize these data with respect to the other test-series, because so many of the subjects (as can be seen by Table I), did not take part in these latter series.

(*Concluded in the September number.*)

THE BINET-SIMON MEASURING SCALE FOR INTELLIGENCE:

AN ANNOTATED BIBLIOGRAPHY. PART III.

SAMUEL C. KOHS,

Vineland Research Laboratory.

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170. MYERS, C. S. *The Pitfalls of "Mental Tests."* Rep. Brit. Assn. Adv. Sci., 1910, pp. 808-809. Also Brit. Med. J., 1911, 1: 195-197. Also Zsch. f. angew. Psychol., 1912, 6: 60-65.

Warns against deducing conclusions from a "hodge-podge" of statistics. There are racial differences in correlations. The scale is faulty because it lacks the element of introspection. The treatment of data "en masse" is liable to blur the real facts.

171. NEWMAYER, S. W. *Medical and Sanitary Inspection of Schools.* Phila., New York: Lea and Febiger, 1913, pp. 262-295.

An excellent statement of the tests as now used in Vineland.

172. OTIS, M. *Another Laboratory of Research in Delinquency.* Survey, 1913, 31: 160-161.

One hundred and seventy-two reformatory girls examined. Seventy-five per cent. were found defective.

173. OTIS, M. *The Binet Tests Applied to Delinquent Girls.* Psychol. Clinic, 1913, 7: 127-134.

Nearly two hundred cases. Ages ten to twenty. The scale is very valuable, but does not reveal the complete condition of the delinquent.

174. POTTS, W. A. *Tests of Intelligence.* Brit. Med. J., 1912, 1: 880-883.

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of more importance for diagnostic purposes than the fact whether he did it correctly or not."

175. PYLE, W. H. *A Suggestion for the Improvement and Extension of Mental Tests.* J. of Educ. Psychol., 1912, 3: 95-96.

Urges a more extensive testing of the different mental capacities. Advises a wider use of the scale.

176. PYLE, W. H. *Standards of Mental Efficiency.* J. of Educ. Psychol., 1913, 4: 61-70.

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181. ROSSOLIMO, G. *On the Psychological Profile of Backward Children.* 1. Russ. Congr. f. Exper. Ped., 1910. (In Russian.)

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182. ROSSOLIMO, G. *The General Characteristics of the Psychological Profile.* Moscow: ————, 1910, pp. 106. (In Russian.)

183. ROSSOLIMO, G. *Psychological Profiles: the "Methodik."* Moscow: ————, 1910, pp. 52. (In Russian.)

184. ROUSSEL, S., ET BINET, A. (*Correspondence*). Bull. Soc. libre Etude psychol. de l'Enfant. 1910, 10: 89-92.

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185. SAFFIOTTI, F. U. *Résumé des résultats d'un controle a l'échelle métrique de l'intelligence de Binet et Simon suivant la méthode Trèves-Saffiotti.* 1. Congr. intern. de Pédol. Bruxelles, 1911.

Six hundred and sixty-six subjects. Criticisms and suggestions.

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195. Seashore, C. E. *The Binet-Simon Tests.* J. of Educ. Psychol. 1912, 3: 50.
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196. Seifert, H. *A. Binet und seine Intelligenzprüfungen.* Kathol. Schulztg. f. Norddeutschld., 29: — —.

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198. Shrubsall, F. C. *The Examination of Mentally Defective Children.* School Hyg., 1911, 2: 564-576, 609-619.
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199. Squire, C. R. *Graded Mental Tests.* J. of Educ. Psychol. 1912, 3: 363-380, 430-443, 493-506.
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201. STERN, W. *Die differentielle Psychologie in ihren methodischen Grundlagen.* Leipzig: Barth, 1911, Kapitel 6.

A short history of the development of intelligence tests. A critical review of test literature.

202. STERN, W. *Fragestellungen, Methoden und Ergebnisse der Intelligenzprüfung.* 1. deut. Kongr. f. Jugendbldg. u. Jugendkde. Dresden, 1911.

Pedagogy now demands a better understanding of the psychological nature of each individual child. Discussion of tests of intelligence and related problems.

203. STERN, W. *Uber die psychologischen Methoden der Intelligenzprüfung und deren Anwendung an Schulkindern.* 5. Kongr. f. exper. Psychol. Berlin, 1912, pp. 1-109. Also Leipzig: Barth, 1912, pp. 1-109.

An excellent discussion of the scale. An examination is made for the scientific basis of the different tests. Some are found defective. Nevertheless, judging by the returns from different countries, it appears that the scale is a valuable instrument.

204. STERN, W. *Zum Vergleich von Vorschülern und Volksschülern.* Zsch. angew. Phychol. 1913, 8: 120-123.

See A. Hoffman. Emphasizes the significance of his results from the point of view of school promotion.

205. STRANSKY, E. *Bemerkungen zur Intelligenzprüfung.* Wien. Med. Wochenschr. 1909, 59: 249, 327, 375.

206. STRONG, A. C. *Three Hundred and Fifty White and Colored Children Measured by the Binet-Simon Measuring Scale of Intelligence: A Comparative Study.* 4. Intern. Congr. School Hyg. Buffalo, 1913 (reptd. by Dr. J. Morse). Also Ped. Sem. 1913, 20: 485-515.

Two hundred and twenty-five white and one hundred and twenty-five colored children were tested. The distribution curve of the whites corresponds to that found by Goddard in his earlier study, but for the colored it is inferior. In the mill villages, however, this difference is but slight. The scale ought to be revised.

207. SULLIVAN, W. C. *La mesure du développement intellectuel chez les jeunes délinquantes.* Année psychol., 1912, 18: 341-361.

The search for the explanation of the anti-social tendencies of delinquents leads us into the affective and not the intellectual sphere.

208. SULLIVAN, W. C. *Feeble-mindedness and the Measurement of the Intelligence by the Method of Binet and Simon.* Lancet, 1912, 182: 770-780.

209. TERMAN, L. M. *Genius and Stupidity.* Ped. Sem. 1906, 13: 307-373.

Binet's memory test.

210. TERMAN, L. M. *The Binet-Simon Scale for Measuring Intelligence; Impressions Gained by Its Application on Four Hundred Non-selected Children.* Psychol. Clinic, 1911, 5: 199-206, 239-244.

The scale needs correction at both ends. Insists on correlation of mental age with physiological and not chronological age.

211. TERMAN, L. M. *A Survey of Mentally Defective Children in the Schools of San Luis Obispo, Cal.* Psychol. Clinic, 1912, 6: 131-139.

The scale is very useful in giving one comparable standards of mental ability.

212. TERMAN, L. M. *Psychological Principles Underlying the Binet-Simon Scale and Some Practical Considerations for Its Correct Use.* 4. Intern. Confr. School Hyg., Buffalo, 1913.

The value of the scale. Errors to be avoided.

213. TERMAN, L. M. *Suggestions for Revising, Extending and Supplementing the Binet Intelligence Tests.* 4. Intern. Confr. School Hyg. Buffalo, 1913.

Very suggestive.

214. TERMAN, L. M. *The Significance of Intelligence Tests for Mental Hygiene.* 4. Inter. Confr. School Hyg. Buffalo, 1913.

Mental hygiene and mental diagnosis are very intimately related.

215. TERMAN, L. M. *A Report of the Buffalo Conference on the Binet-Simon Tests of Intelligence.* Ped. Sem., 1913, 20: 549-554.

A brief abstract of the papers presented.

216. TERMAN, L. M., AND CHILDS, H. G. *A Tentative Revision and Extension of the Binet-Simon Measuring Scale of Intelligence.* J. of Educ. Psychol. 1912, 3: 61-74, 133-143, 198-208, 277-289.

Results and conclusions after examining three hundred and ninety-six California school children. Believe that the scale is too easy at the lower end and too difficult at the upper.

217. TOWN, C. H. *The Binet-Simon Intelligence Tests in Their Application to Defectives.* Illinois Med. J., 1912, 22: 166-177.

218. TOWN, C. H. *The Binet-Simon Scale and the Psychologist.* Psychol. Clinic, 1912, 5: 239-244.

Points out the danger in the use of the scale by the inexperienced and those untrained in experimental psychology.

219. TOWN, C. H. (Translator), BINET, A., AND SIMON, TH. *A Method of Measuring the Development of the Intelligence of Young Children.* Lincoln, Ill.: Courier, 1913, pp. — —.

A very serviceable little handbook.

220. TRÈVES, Z., E SAFFIOTTI, F. U. *La Escala metrica de la Inteligencia de Binet y Simon.* Boletin d. l. Instruccion Publica, Buenos-Aires, 1910, 7: Spanish translation of "La scala metrica, etc.," below.

221. TRÈVES, Z., E SAFFIOTTI, F. U. *La "Scala metrica dell' intelligenza" di Binet e Simon. Espositione e critica.* Milan: Civelli, 1910-1911. Part I and II.

Part I. General suggestions and criticism.
Part II. The 1908 scale.

222. TRÈVES, Z., E SAFFIOTTI, F. U. *Prove mentali per la graduazione dell' intelligenza nella popolazione scolastica elementare.* Paravia, Milan. 1913.

223. VANEY, V. *Un Surnormal.* Bull. Soc. libre Etude psychol. de l'Enfant. 1910, 10: 160-165.

Examined by the Binet scale, a boy of eight tested twelve.

224. VANEY, V. *Les classes pour enfants arriérés.* Bull. Soc. libre Etude psychol. de l'Enfant, 1911, 11: 81-82.

The tests used for diagnosing backwardness.

225. VANEY, V. *L'Examen des candidats aux classes de perfectionnement.* Bull. Soc. libre Etude psychol. de l'Enfant, 1912, 12: 134-144.

The scale is used in selecting candidates for special classes. Very valuable.

226. VANEY, V. *Comment se groupent les élèves d'une classe.* Bull. Soc. libre Etude psychol. de l'Enfant, 1913, 13: 59-66.

A direct, positive correlation is found between the development of intelligence as revealed by the Binet tests and school work.

227. VANEY, V. *Le diagnostic des arriérés scolaires.* L'Enfance Anorm., 1913, 20: 509-514.

In the past five years the scale has proven a most valuable aid in diagnosing backwardness and feeble-mindedness.

228. VILLIGER, E. *Die Erkennung des Schwachsinns beim Kinde.* Leipzig: Engelmann, 1913, pp. 90.

A full explanation of the scale and the directions for its application.

229. WALLIN, J. E. W. *A Practical Guide for the Administration of the Binet-Simon Scale for Measuring Intelligence.* Psychol. Clinic, 1911, 5: 217-238.

Directions for using the 1908 scale. Suggested revisions.

230. WALLIN, J. E. W. *The New Clinical Psychology and the Psycho-Clinicist.* J. of Educ. Psychol., 1911, 2: 121-132, 191-210.

An outline of the development of clinical psychology, its present position and future.

231. WALLIN, J. E. W. *Human Efficiency.* Ped. Sem., 1911, 18: 74-84.

Criticism of the scale. Some further suggestions.

232. WALLIN, J. E. W. *The present Status of the Binet-Simon Graded Tests of Intelligence.* Alienist and Neurol., 1912, 33: 162-173.

The need for more norms is great.

233. WALLIN, J. E. W. *Experimental Studies of Mental Defectives. A Critique of the Binet-Simon Tests.* Baltimore: Warwick & York, 1912.

234. WALLIN, J. E. W. *Eight Months of Psycho-clinical Research at the New Jersey State Village for Epileptics, with Some Results from the Binet-Simon Testing.* Epilepsia, 1912, 3: 366-380.

The value and shortcomings of the scale demonstrated.

235. WALLIN, J. E. W. *Danger Signals in Clinical and Applied Psychology.* J. of Educ. Psychol., 1912, 2: 224-226.

The 1908 scale should be regarded as the standard. Advises wide-range testing. Argues against the appointment of people to psycho-clinical positions who have had but little training.

236. WALLIN, J. E. W. *Aspects of Infant and Child Orthogenesis.* Psychol. Clinic, 1912, 6: 153-173.

"One of our best schemes of mental classification is the Binet-Simon scale. But after having personally used this scale almost daily for more than two years in the study of the feeble-minded, epileptic, insane, juvenile delinquent and backward children, I am free to confess that, while the great utility of the scale cannot be questioned, it is not by any means the marvelous, unerring machine which it is claimed to be by certain overzealous exploiters, even for the purpose merely of measuring the degree of mental arrest."

237. WALLIN, J. E. W. Transactions Nat. Assn. for Study of Epilep., 1912, 8: 29.

238. WALLIN, J. E. W. *Current Misconceptions in Regard to the Functions of Binet Testing and of Amateur Psychological Testers.* 4. Intern. Congr. School Hyg., Buffalo, 1913.

Warns against the amateur and advises less faith in the scale as a perfect mechanism.

239. WALLIN, J. E. W. *Re-averments Respecting Psycho-Clinical Norms and Scales of Development.* Psychol. Clinic, 1913, 7: 89-96.

Expert preparation for psycho-clinical work should include, by means of an "interneship" of at least one year, the intimate study of subnormal types, plus a thorough training in psycho-therapeutics. Criticism of recent attempts at revision. Advises the use of ten tests in each year and wide-range testing.

240. WARBURG, F. *The Naming of Colors as a Test of Intelligence Among Children.* Internat. Archiv. f. Schulhyg., 1910, 6: 183-184.

His findings are positive.

241. WATSON, J. B. *Content of a Course in Psychology for Medical Students.* 20. Ann. Meetg. Amer. Psychol. Assn. 1911.

Advises the inclusion of a course on the Binet-Simon tests.

242. WEIGL, F. *Intelligenzprüfung von Hilfsschülern nach der Testmethode.* Beitr. z. Kinderfrschg. u. Heilerzg. 1913, Heft: 111. Also Zsch. f. Kinderfrschg. 1913, 18: 374-380, 455-462, 509-530.

An examination of different test systems, including Binet's, and a tabular comparison of the latter with Ziehen's. Tested fifty-five boys and thirty-eight girls, ages seven to thirteen. Finds scale very valuable for immediate diagnosis.

243. WEINTROB, J. AND R. *The Influence of Environment on Mental Ability As Shown by the Binet Tests.* J. of Educ. Psychol., 1912, 3: 577-583.

Found that environment had no apparent influence on mental ability. Three large groups of children were compared.

244. WHIPPLE, G. M. *Manual of Mental and Physical Tests.* Baltimore: Warwick & York, 1910, pp. 473-517.

Explanation of the 1905 and 1908 scales, with some suggested improvements.

245. WHIPPLE, G. M. *The Amateur and the Binet-Simon Tests.* J. of Educ. Psychol., 1912, 3: 118-119.

Urges the careful use of the scale only by those specially trained.

246. WHIPPLE, G. M. *Amateurism in Binet Testing Once More.* J. of Educ. Psychol., 1913, 4: 301-302.

Condemns the use of the scale by physicians, teachers, nurses and laymen. It is only a tool to be used by the psychologist.

247. WHIPPLE, G. M. *The Fourth International Congress on School Hygiene.* J. of Educ. Psychol. 1913, 4: 476-478.

A brief summary of the conferences on the Binet scale is included in the report.

248. WHIPPLE, DR. AND MRS. G. M. *The Vocabulary of a Three-year-old Boy.* Ped. Sem., 1909, 16: 19.

Binet colors.

249. WHITE, W. A., AND JELLIFFE, S. E. *The Modern Treatment of Nervous and Mental Diseases.* New York: Lea & Febiger, 1913. Vol. I, pp. 155-174.

A portion of the chapter written by Goddard on the "Educational Treatment of the Feeble-minded" contains the scale as now used in Vineland.

250. WIDEN, L. E. *A Comparison of the Binet-Simon Method and Two Discrimination Methods for Measuring Mental Age.* Thesis, Graduate College, Iowa City, 1911.

251. WIJSMAN, J. W. H., UND SCHREUDER, P. H. *Die psychologische Methode Binet und Simons zur Bestimmung des Grades des Intellekts, angewandt bei zurückgebliebenen Schulkindern.* Zuid en Noord, 1912, 3: 186 ff., 323 ff.

252. WINCH, W. H. *Binet's Mental Tests: What They Are, and What We Can Do with Them.* Child-Study, 1913, 6: 113-117 (to be continued).

The scale is recommended as the best there is, and it is asserted that the tests will prove of immense value in the hands of the teacher.

253. ZIEHEN, TH. *Die Prinzipien und Methoden der Intelligenzprüfung.* Berlin: Karger, 1911, pp. 94.

Some of the Binet tests used in his scheme.

254. ZYLBER, D., ET LUBLIMER, E. *Institut pour enfants arriérés à Varsovie.* 1. Congr. intern. de pédol. Bruxelles, 1911.

A private institution founded in 1908 (Warsaw, Russia) finds the scale very valuable for classificatory purposes.

(THE END.)

COMMUNICATIONS AND DISCUSSIONS.

THE NEED FOR A MEASURING SCALE OF PEDAGOGICAL STATUS.

Now that we clearly recognize the high degree of variability in different departments of ontogeny, it may not be inappropriate to call more general attention to the need for some device for determining the scholastic abilities of individual children by clinical diagnosis. There is the Binet Scale for determining mental age, and the various methods of determining physiological age, and the Smedley tables for physical age, and the birth register for chronological age, but so far there is no adequate means of determining scholastic age except by years in school or else by grade in school. But school grade is altogether too inaccurate for universal and comparative research in the correlations of these various age-developments. Different schools are of as varied efficiencies as are the different teachers in these schools, so that we are at present unable to say what is a standard performance in scholastic ability for a child of a given age and sex. Thus, for instance, a child comes to a clinic for examination. We have at least tentative norms for nearly every line of his development except the educational. He has, say, been to an average school for seven years. The questions arise: What is his speed and efficiency in writing, in reading, in arithmetic, in constructive thinking, in reproduction; what is the extent of his vocabulary, how much does he know of past or present events, how well can he draw, what is his learning capacity, how well can he spell? And so on through all the ordinary school studies. In other words, we wish to be able to measure the degree of profit he has gained from the training that has been his, in order that we may forecast the likelihood in training that may or should be his.

Take a specific case. Martin is admitted to the Training School. He is nearly fifteen years of age. He has had a good home environment and all the advantages of the ordinary and special classes of a city that is noted for its excellent special classes. He was in the regular grades four years and in the special class three years. With the Binet scale he tests almost eight years. In order to give him a

fair classification in the institution it would be extremely desirable, if not quite necessary, to determine accurately to what extent he has profited from previous schooling and is likely to profit from future training or education. Indeed, which shall be prescribed for him, training or education? There are many tests at hand for our purpose, but almost none of them is available in standardized norms for individual performances. For learning capacity we might apply the substitution tests, or the mirror-drawing tests, or the practice tests in co-ordination, but when we should have finished we should have nothing more definite than our subjective impressions and an objective record, with no norms for comparison. Similarly we might apply Starch's test for handwriting and see how well and how often he can write "Mary had a little lamb" in two minutes, but in a personal letter Dr. Starch informs me that there is an extremely high m. v. in the results of his tests by individuals, so that we probably could not use his class averages for individual diagnosis. Or we might use the Courtis tests in arithmetic processes and in reading, writing, composition and reproduction, but here, again, we know nothing of the performances by individuals, and, besides, the tests are too difficult for any type of feeble-mindedness below moronity. And similarly for all the other tests of scholastic performance that have so far been presented.

Is it not time and is it not possible to devise a measuring scale of pedagogical status similar to the Binet Scale for measuring intelligence? By following the methods of Courtis and Starch and Whipple and Thorndike and all the rest we ought to be able to arrange a series of tests, easy to administer, easy to credit, requiring almost no apparatus, graded by successively difficult tasks, or by greater accomplishments in the same tasks, that shall enable us to obtain results free from subjective appraisal and the roughest kind of crediting. At present our experimental results read somewhat as follows: "Can write his name," "Can write a little from dictation," "Can copy a sentence," "Can read single words," "Reads in the primer," "Reads in the third reader," "Counts to 10," "Can add a little," "Does fractions," "Is able to compose a little story," "Observation good," "Attention fair," "Memory excellent," and so on through a long list of equally indefinite appraisals of equally indefinite test methods. There are no standard tasks to set and no standard performances to accept.

The principles of such a scale are exemplified in Binet's work, and the literature of experimental educational psychology is full of excellent material. With the great work of Courtis already before us, the standardization of tests based on these principles need not be too appalling.

E. A. DOLL.

Vineland, N. J.

STANDARDIZING GRADES.

At a meeting of the president's council of George Washington University, held Friday, March 20, 1914, the following report, submitted by Dean Ruediger for the Committee on Standardizing Grades, was approved:

The Committee on Standardizing Grades appointed last June begs leave to submit sugestions upon the following two problems:

1. How can the amount of work required for each unit of credit be approximately equalized in the various courses?

2. What common standard of grading can the various members of the faculty observe so that they will all grade approximately on the same standard?

In submitting principles and standards for the solution of these problems, the committee wishes, first of all, to be understood that it does not wish to dictate, or even to suggest, how any member of the faculty should do his work. It not only has no intention of curtailing the legitimate rights and freedom of any teacher, but it desires especially to emphasize that these rights and freedom are sacred; that they are an indispensable condition for the best type of university work.

But in schools, colleges and universities the personal side is not the only side to teaching. There is present also a social side, which grows out of the fact that a school is in some fundamental aspects a social unit. The various members of the faculty are all working to contribute in piecemeal to the same end. They are all contributing to the rounded education of individuals, and to the extent that social relationships are involved in this process to that extent is it necessary to observe similar standards and principles. When this is not done, the equilibrium and the efficient working of the whole is disturbed. Students in considerable numbers will elect those

courses in which they can get the largest number of credits or the highest grades, or both, for the least work; and they will shun those courses in which the opposite is true.

But in observing similar standards and principles in those matters that pertain to the school as a whole, it would seem that no desirable aspect of the personal freedom of the teacher needs to be violated. A common goal only needs to be recognized, the manner of reaching the goal being left to the individual teacher. We have here an example of the type of liberty within law that obtains elsewhere in society.

Equalization of Units.

It appears to be true that the amount of work required of students in different courses carrying equal amounts of credit varies greatly. While in some courses little more than attendance upon lectures and the passing of examinations is required, in others from one to three, or even four, hours of outside preparation for each lesson is required in addition. To minimize this divergence the committee recommends:

(a) That all teachers strive to require about two hours of outside preparation for each lesson.

(b) That courses which are now so weighted that they cannot be completed with this amount of study be readjusted, so that they can ordinarily be completed with two hours of preparation for each lesson.

(c) That lecture courses in connection with which it is impossible or undersirable to assign any considerable amount of outside work carry one-half as many credits as the number of lectures per week.

Distribution of Grades.

Considered from the social standpoint, the college, in common with other schools, performs two interrelated, although distinguishable, fundamental functions. It (1) educates and it (2) selects.

The educative function is the one commonly recognized, and is in outline well understood. It includes the importing of ideals, knowledge and skill.

The selective function, on the other hand, has been less commonly recognized, but it has always been present and is socially indispensable. The school not only imparts ideals, knowledge and skill, but

it also designates those who have acquired these characteristics, and by the assignment of grades it aims to indicate the degree in which they have acquired them.

The giving of grades to students is only one of a number of means that the school uses in discharging the selective function of education, but it is one of the most important. Like other educational functions, it must be done carefully, intelligently and uniformly, in order to avoid injustice to the student. The desideratum of uniformity requires not only that each teacher always use approximately the same standard with all of his students, but that all teachers use approximately the same standard with all students. When this is not done, the educational equilibrium of the school is disturbed and injustice is done to the earnest and conscientious student. The less serious the students are, the more they tend to gravitate toward the teachers that give the higher grades, and the injustice that this tends to work upon the conscientious student when it comes to the awarding of honors and the recommending for positions is obvious. The giving of many high grades, furthermore, gives many students a false and exaggerated notion of their ability. The grade of "A" especially should be reserved for very exceptional ability which in the nature of the case is rare.

The principle underlying a uniform standard of grading is found in the distribution of mental ability as revealed by psychological investigations. These investigations have shown, when sufficiently large numbers of people are considered, that ability in general or in any particular line is distributed in the form of a bell-shaped curve, technically known as the probability curve or the normal surface of frequency. Letting the base line represent the degrees of ability from poorest to best and the vertical lines the numbers of persons possessing each degree of ability, it is clear that there is but a small number of students with excellent ability, a larger number with good ability, a relatively large number with medium or average ability, a smaller number with sub-medium but passing ability and a small number with distinctly unsatisfactory ability.

There are, of course, no sharp dividing lines between these different groups, and any such lines that are drawn are arbitrary. But when the base line is divided into five equal steps, representing therefore five approximately equal steps of ability, the percentages of students that fall into each group are approximately as follows:

Excellent.....	(A)	4	Per Cent.
Good.....	(B)	24	" "
Medium.....	(C)	44	" "
Sub-medium.....	(D)	24	" "
Failure.....	(E)	4	" "
Total.....		100	Per Cent.

These percentages mean in the present connection that a teacher's grades should in the long run be distributed approximately in the amounts indicated. The grade of A or Excellent should be assigned to about 4 per cent. of the students, B or Good to about 24 per cent., C or Medium to about 44 per cent., D or Sub-medium to about 24 per cent. and E or Failure to about 4 per cent. It is quite likely that the percentage of failures in the lower classes may properly be somewhat higher than that in the upper, with corresponding changes in the other percentages, and failures may perhaps also properly be more frequent in professional schools than in liberal culture schools. Because of its immediate social responsibility, it is the duty of the professional school to apply the principle of selection rigidly.

It should, however, not be inferred that the grades assigned in any particular class, especially in a small class, must approximate closely to the distribution above given. The expression, "In the long run," should be emphasized. The principle cannot be applied mechanically, but it devolves upon each teacher to school himself to recognize excellent ability, good ability, and so on.

W. C. RUEDIGER.

George Washington University.

A CONFERENCE ON INDIVIDUAL PSYCHOLOGY.

At Columbia University, April 6-8, inclusive, a conference on Individual Differences, participated in by former students of Professor James McKeen Cattell, was held to do honor to America's first professor of psychology on the occasion of his twenty-fifth year of professional service.

The conference proved to be of unusual interest. The former students represented a wide geographical distribution, from Massachusetts to California. There were five sessions in all, besides the

final banquet: one largely on general experimental psychology, one devoted to educational psychology, a third to anthropological topics, one to psychological tests and vocational guidance and one to abnormal psychology.

It is not easy to summarize so varied a program. One significant feature, however, was the evidence of a growing interest in the scientific investigation of the psychological problems which confront the administration of the elmentary school. Professor Elmer E. Jones of Indiana University pointed out how common methods of classification ignore known individual differences in school children and retard brilliant pupils, to the great detriment of all concerned.

Dr. Bruner of the department of child study, Chicago Public Schools, entered a protest against the assumption that mental tests now enable us to read off mental constituency as we can read off the temperature of a room, and advocated a return to a more conservative yet practical attitude with respect to the use of mental tests and more exact methods of procedure. He reported correlations ranging from .27 to .46 between certain mental tests and school marks. In the opinion of the writer, the fact that no higher correlations were found is due to the shortness of the time given to the testing of each child.

Dr. Norsworthy of Teachers College took occasion to point out decided limitations in the data and methods of certain investigators who have recently taken the position that feeble-minded children form a separate species and to reinforce the opposite contention.

Professor A. L. Jones of Columbia University reported rather high correlations between entrance examination grades and college records.

There were no less than three reports of experimental data bearing upon the effect of practice on individual differences. The weight of evidence indicated that under usual conditions practice did not tend to eliminate individual differences, and that first trials at a test were relatively unreliable as indications of final ability, though Professor Brown of the University of California reported a correlation of .65 between performance in the first test of a series and the last trial after a period of eight or ten days of practice.

No little interest was evidenced in a report presented by Professor H. H. Woodrow of the University of Minnesota, soon to be published, on a new method of measuring the power of attention.

One of the most notable features of the session devoted to Vocational Guidance was the address by Professor Breese of the University of Cincinnati on "Applications of Psychological Tests to the Determination of Industrial and Professional Fitness." Professor Breese outlined the elaborate analysis of the mental constituents that would seem to be of significance in professional success, now in use in the University of Cincinnati. As yet such analysis has proved to be quite inadequate, for there is little correlation between predictions of future success made on this basis and actual success. Psychology has not yet analyzed either the man or the job, but must face these problems.

Professor Bonser of Teachers College called attention to some difficulties that Individual Psychology has to face in meeting the problems of vocational guidance, and outlined some attempts now being made at Teachers College to solve them in a scientific way.

Limitations of space prevent even a summary of the "Indications of a Connection Between Accidents, Divorce, Alcoholism, Illegitimate Birth and Mental Defect," brought out by Siegfried Block, medical examiner, Children's Court, Brooklyn, or of the "Studies of the Only or Favorite Child in Adult Life," interpreted by A. A. Brill, chief of clinic, department of psychiatry, Columbia University, or of the "Traits of the Psychoses from the Standpoint of Individual Differences," by F. Lyman Wells of Harvard University. Each program was so full that little time was available for discussion.

Wednesday evening brought together the former students of Professor Cattell around the banquet tables of the Faculty Club to hear the story of development of psychology to its present status among its sister sciences. Reminiscences emphasized the insistence upon the getting of facts and the accurate statement of them, which had been so marked a feature of the influence of Professor Cattell. In presenting to Professor Cattell his students' token of esteem—a volume reviewing a part of his numerous writings—Professor E. L. Thorndike paid a tribute to America's first professor of psychology that fittingly expressed the feelings of those present toward their honored guest, whose genius has been their inspiration and whose leadership has been their guide.

B. R. Simpson.

Brooklyn Training School for Teachers.

ABSTRACTS AND REVIEWS.

HUGO MUENSTERBERG. *Psychology and Industrial Efficiency.* Boston: Houghton Mifflin Company, 1913, pp. 309, $1.50 net.

Professor Münsterberg presents the attitude of experimental psychology toward economic problems. The book is divided into three parts, dealing respectively with the best possible man, the best possible work, and the best possible effect. In the first section he discusses vocational fitness, vocational guidance, and the psychology of scientific management, and then gives some concrete illustrations of the use of the laboratory methods of testing in determining the adaptability and value of a person for a given vocation, such as the electrical railway service, ship service, or telephone service. In the second part he discusses the adjustment of work to psychological conditions, the economy of movement, monotony, attention, fatigue, and social influences on working power; and in the third section, the satisfaction of economic demands, advertisements, display, imitation, buying, and selling. The book is written in popular style, but represents the conservative judgment and the keen foresight of the scientific man in a statement of the possibilities and a forecast of the future of economic psychology. C. E. S.

EDOUARD LEROY. *The New Philosophy of Henri Bergson.* (Translated from the French by Vincent Benson, M. A.) New York; Henry Holt and Company, 1913. Pp. 235. $1.25 net.

The newness of this philosophy consists in the fact that it is a reincarnation of the old Heroclitean doctrine of *becoming,* reinforced by modern science and psychology and presented with a linguistic skill comparable to that of William James.

Being merely an exposition of a system, this book, like all of its kind, is but a reflection of the original; yet it is worth reading by teachers since it presents so many fruitful points of view for education. A few of these may be briefly mentioned as follows:

1. We tend to obscure the realities presented to the mind through observation by conventions of language or thought arising from

convenience or from practical life. Thus one may dwell in the midst of beauties without perceiving them; the wide significance of an idea or thing may not be seen because of fixed and often petty views concerning it.

2. This fact is reflected in the school when apperceptive masses become inert and static through the mental inertia of the teacher or reliance upon verbal memory or the inhibition of growth by excessive drill. According to Bergson, thought and its corresponding expression must be fluid and must be animated by a principle of irresistible expansion and development. The boundless curiosity of a child concerning the things of his environment must not be quenched upon entering school, but must be encouraged, so that he shall acquire an ever-increasing thirst for an ever-developing view of the world.

3. "The essence of reality is becoming." A mere analytical habit of mind does not enrich thought, since it tends to arrest mental growth. Hence the tendency of mathematics and all *a priori* science is toward mental stagnation, in so far as they check a developing experience. Mathematics, however useful in practical affairs, however valuable in the classification of given concepts, tends to bring the formation of concepts to a stop.

4. *Creative Evolution* is the watchword of Bergson's philosophy; it should be that of the school. We must not let schoolroom routine, the conventionalities of language or the conveniences of practical life obscure this view or check the spontaneous growth of the mind and the consequent development of an ever-expanding view of things as they are in reality.

CHARLES DE GARMO.
Cornell University.

TSURU ARAI. *Mental Fatigue.* Teachers College, Columbia University: Contributions to Education, No. 54, 1912. Pp. 115. $1.

In this study of fatigue the author has certainly been thorough, if not almost heroic, in securing true mental fatigue, as may be judged when one reads that one of the tasks was the mental multiplication of pairs of four-digit numbers for hours on end. The investigation was limited to the influence of mental fatigue on (*a*) certain physical processes, (*b*) the feelings of fatigue, and (*c*) intellectual efficiency.

The physiological processes recorded were pulse and bodily temperature (no definite results), and the two subjects here investigated were (1) the direction and amount of change in pulse rate during continuous mental work lasting long enough to produce such fatigue as to decrease intellectual efficiency, and (2) the correlation between the change in the pulse rate and the change in mental efficiency.

The problem of the feelings of fatigue was subdivided as follows: (1) the direction and amount of change in the feeling of fatigue during continuous mental work, (2) the correlation between the state of this feeling and mental efficiency, and (3) the correlations between the change in the feeling and the change in mental efficiency.

The third problem was likewise subdivided into (1) the factors having an influence on the efficiency of mental functions (practise, fatigue, etc.), (2) the effect of mental fatigue on efficiency in the special function exercised, (3) the transfer of fatigue, including (*a*) the influence of the school day for the student on special functions like adding, (*b*) influence of the exercises of special functions on other functions, and (*c*) correlation between fatigue in two functions both affected by the same mental work, and (*d*) individual differences.

The results of the investigation were as follows:

I. There was found a decrease in pulse rate due to continuous mental work, which is positively, though slightly, related to decreases in efficiency.

II. The feeling of fatigue is somewhat, though far from perfectly, correlated with the state of mental inefficiency.

III. (1) No regular 'warming-up' effect was observed and the author inclines to the conclusion that warming-up is not present in functions where the subject has reached the limit of practise. There were also no spurts observed in fatigue curves.

(2) Difficult and disagreeable continued work brings about a decrease in efficiency of the function exercised.

(3) Fatigue in a special function, as well as in general, is slightly transferable, and the greater the fatigue the greater the transfer-effect.

(4) Great individual differences were found. As a rule, the more competent people are less affected by fatigue.

The tabulation of the results is as thorough as the method of securing fatigue, but it is unfortunate in the use of correlations; the author assumes, for example, that a slight correlation exists when the coefficient is only 0.11 and the probable error unmentioned. All the statements as to correlations must be taken cautiously. It is at least unfortunate that material as valuable as that contained in this monograph should have been brought together in such a poorly organized presentation.

D. KENNEDY-FRASER.

Cornell University.

G. G. WENZLAFF. *The Mental Man: An Outline of the Fundamentals of Psychology.* New York: Charles E. Merrill Co., 1909. Pp. 272.

P. M. MAGNUSSON. *Psychology as Applied to Education.* New York: Silver, Burdett & Co., 1913. Pp. x, 345.

These two books—both of which are written by normal school men—are representative of the present-day teaching of psychology in the better normal and training schools. Although written from slightly different points of view and although each has its distinctive style of presentation, both reflect with a fair measure of fidelity the scientific and empirical attitude toward the study of mental phenomena.

President Wenzlaff's book is the more ambitious and comprehensive of the two. In its twenty chapters one may find treated almost every topic of modern psychology. Indeed, we know of no other book of the same bulk which covers the field so extensively. Needless to say, the treatment in many places is far from intensive; nevertheless—taking into account the wide range of materials—the author has done his work in a manner that deserves commendation. The style is clear, straightforward and occasionally picturesque; a sustained combination of the three qualities would perhaps be too much to expect, invaluable as the last-named quality is in an introductory text. We have some misgivings, however, as to the wisdom of attempting to cover so many topics with a beginning class, and many misgivings as to the value of some of the topics in a text apparently intended for teachers. Capter xii (Unexplained Mental Phenomena), for example, is hardly sufficient to guard the neophyte agains the wiles of the "psycho-faker," which seems to be the very laudable purpose of the author. The instances that it cites are chiefly anecdotal in character, and the general impression that it would leave with the young student would, we believe, be quite the opposite of that which is evidently desired. If a chapter on heredity is given a place in an introductory text, it certainly deserves more than seven pages if it is to be serviceable—nor can we see that the author is justified in rejecting the Weismannian hypothesis because of the difficulty of accounting for the instincts on any basis save that of use-inheritance. The chapter on memory is replete with interesting anecdotes of uneven value if not of uneven validity; but no reference is made to the facts (pedagogically very important) which experimental research has made available. The same defect characterizes the treatment of habit. A chapter on the nature of knowledge certainly deserves a place in a psychology for teachers, and the author's treatment here—while somewhat too suggestive of epistemological antecedents—should be helpful to the student.

On the whole, the book appeals to us (in spite of what we have said in criticism) as well worth while. We note a few inadvertencies and misprints: Darwin's *"Expression and Emotion"* is referred

to; Max Dessoir appears in three places (including the index) as Max "Dessior;" to say that "sensations may occur * * * without external stimuli" is misleading and in direct contradiction to the definition of sensation which the author accepts. In general, however, the statements and citations have been made with obvious care.

Dr. Magnusson writes much more informally—almost too informally at times, *e. g.* "I had really fired at the ghost of a duck brought up from the cold storage of my memory" [p. 29]; "The munching school girl is not pursuing happiness, her soul is set on caramels" [p. 107]; but we quite agree with him that "teachers often seem to avoid the human, broad, interesting side" of their subjects as "not dignified or 'scientific' enough for the schoolroom," and we are sure that many teachers of psychology have erred in making their courses too "outliny" (to use another of the author's informal expressions.) The book is very readable and, we should infer, readily teachable. There are some things about it that we do not like—for example, the apparent acceptance of the dogma of formal discipline: "Mathematics is the best discipline for clearness, exactness and definiteness" (p. 38); "Insist on perfect work in handicraft and thus secure exact and clear imagination" (p. 39); "As a discipline in exact, clear and definite thought and expression, the study of mathematics is unexcelled" (p. 279). But mathematics and handwork seem to exhaust the disciplinary possibilities; consequently we should not interpose too serious an objection.

The chief merit of the book is its wealth of concrete illustration. Many of the cases that are citied, it is true, bear the unmistakable earmarks of the institute-lecture platform, and as a rule material that "takes well" when given from the platform makes a quite different impression when crystallized in cold type. The present volume does not altogether escape this defect—yet its "breeziness" would be a good antidote to the too-formal teaching of psychology that commonly characterizes the beginning work of the university-trained specialist who goes into the normal school or small college where the psychological courses must of necessity be inspirational as well as instructional—courses perhaps in ethical norms as well as in scientific principles and theories. To this young teacher of psychology Dr. Magnusson's book would form a helpful corrective, not only because of its innumerable illustrations, but also because of the unusually good questions and exercises that are appended to each chapter, and because of the five chapters of "Pedagogical Applications of Psychology" with which the volume is concluded. One of these five chapters, it should be added, contains a very readable outline of the Montessori system, and all of them reflect current standards of teaching and management very acceptably, although to call these chapters "applications of psychology" is something of a misnomer.

W. C. B.

F. B. DRESSLAR. *School Hygiene.* New York: The Macmillan Co., 1913. Pp. xii, 369. $1.25 net.

A text of this sort has been needed for several years, for the progress that has been made in school sanitation and hygiene, and the wide popular interest that has been developed in all questions concerning the health of children have rendered practically obsolete the books that have been generally used for classroom instruction.

Considering the difficulty of constructing a text that will meet the needs of our heterogeneous teaching population, Dr. Dresslar has done his work in a way that merits warm commendation. It is, indeed, a serious problem to write a book that can be profitably studied by girls in the normal courses of the high school, by normal school seniors, by university graduates and by public school teachers of all grades of preparation and experience, and this problem Dr. Dresslar has met passing well. The various topics are treated simply and clearly, and yet with due respect to the scientific proprieties. The chapter on humidity, for example, does not dodge the difficulties which an understanding of the problem necessarily involves, and yet the treatment will be perfectly clear to every intelligent reader.

The recent progress of school hygiene is clearly indicated by the inclusion of many types that have not hitherto found a place in elementary texts in this field; an excellent chapter discusses stuttering and stammering; another treats of plays and playgrounds; medical inspection receives adequate attention. The two concluding chapters are also worthy of notice,—"Qualifications and Duties of a School Janitor," and "Disinfectants." W. C. B.

THE
JOURNAL OF EDUCATIONAL PSYCHOLOGY
INCLUDING EXPERIMENTAL PEDAGOGY, CHILD PHYSIOLOGY AND HYGIENE, AND EDUCATIONAL STATISTICS

Edited by

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J. CARLETON BELL, Managing Editor. GUY MONTROSE WHIPPLE.

Published monthly except July and August by
WARWICK & YORK, INC.,
BALTIMORE, MD.

Manuscripts for publication, books or other material for review, and news items of interest to educational psychologists should be addressed to The Managing Editor, J. Carleton Bell, University of Texas, Austin, Texas. Research contributions from England may be sent to W. H. Winch, Esq., Melville Villa, Overhill Road, Dulwich, London.

The Journal is issuing a series of Monograph Supplements for the publication of more extensive researches in educational psychology. For details prospective contributors may apply to Guy Montrose Whipple, Cornell University, Ithaca, N. Y.

The price of the Journal is $2.50 per year of ten monthly issues. Foreign postage is 20 cents extra for Canada and 30 cents for other countries in the Postal Union.

Subscriptions and correspondence concerning business matters should be sent to Warwick & York, Inc., 19 W. Saratoga St., Baltimore, Md.

VOLUME V JUNE, 1914 NUMBER 6

EDITORIALS.

FEEBLE-MINDEDNESS IN THE COURTS.

The recent trial of Jean Gianini for the murder of his teacher at Poland, N. Y., presents phases that are of interest to the educational psychopathologist. Gianini, who is 17 years of age, had given trouble in school two years before, had been isolated from the rest of the pupils by the teacher, and had finally been expelled. He drifted about for two years, then returned to Poland and asked to be reinstated. His former teacher interested herself in the boy, and agreed to accompany him to the house of his father to arrange for his return to school. On the way the boy struck her on the head with a wrench, and completed his work by slashing her with a knife. At the trial his own confession and the evidence of a companion showed that the deed was the result of a grudge against the teacher for seating him apart from the others, and had been premeditated. The defense was insanity. The trial was noteworthy in that for the first time in a murder case in this country the Binet tests were introduced, explained and entered on the court record. According to these tests, the boy is clearly feeble-minded, showing

a mental age of 10 years. The trial also offered the first instance of the acceptance by the courts as expert testimony the evidence of a non-medical specialist in feeble-mindedness (Dr. H. H. Goddard), and the general consideration of the legal status of the feeble-minded. The jury rendered a verdict of not guilty because of insanity, and the boy was confined in Matteawan. The case serves to call the attention of the public to the necessity for a more careful study and intelligent treatment of the feeble-minded, and emphasizes the need for the law recently passed by the New York Legislature simplifying the procedure in the detention of the mentally defective. J. C. B.

APPLICABILITY TO CHILDREN SECURED WITH ADULTS.

The article by Dr. Dallenbach in the present issue leads to results that seem worth editorial comment. Without going into details at this point, it is shown by his study that conclusions arrived at by experimentation upon adults, or at least upon such selected types of adults as are usually available as subjects in the university laboratory, may not accord with the conclusions arrived at by experimentation upon children. Naturally, there is nothing startling, or even new, in this statement. We are accustomed to seeing experimental results, *e. g.*, statistics of discriminative capacity for weights, tones, etc., arranged to bring out dependence on age as well as upon other variable factors. Nevertheless, I believe that in one important phase of experimental work—that dealing with the effects of practice and its spread or transfer—experimentation with children has been somewhat neglected, and that most of the conclusions now current upon the nature of formal discipline have been based upon observations carried on with adults. But adults, in the very nature of the case, should not be much open to transfer of training or to permanent or striking modification of ability, either specific or general. With children, however, whose mental habits are partially unformed and in the very process of making, it is possible that skillful drill may produce effects that will differ qualitatively as well as quantitatively from those produced with adults. The whole problem of practice might be recanvassed to advantage with children working under classroom conditions. G. M. W.

NOTES AND NEWS.

A contribution to the measurement of the efficiency of teachers has been made by Dr. A. Monroe Stowe, professor of education in DePauw University. In a little pamphlet entitled "A Method of Recording and Reporting Critical Observations of Classroom Instruction," Dr. Stowe presents 10 sets of questions, from 5 to 11 questions in each set, as aids to observation, and provides a scorecard on which the results of the observation may be conveniently recorded. The questions deal with general traits of the teacher, the teacher's aims, the work of the students, the subject-matter of the lessons, the lesson assignments, time lost, questions asked, drill lessons, topical lessons and problem lessons. While some of the questions might be improved, the device is one which will be valuable for both superintendent and teacher.

Mr. S. A. Courtis, author of the well-known Standard Tests in Arithmetic and English, has recently arranged with the World Book Co. to issue a series of Standard Practice Tests in the four operations with whole numbers. These practice tests are based on the following principles, derived from the results of testing work in many parts of the country: 1. Definiteness of aim. 2. Limitation of training. 3. Recognition of individual differences. 4. Specialization of training. 5. Diagnosis of causes of difficulty. 6. Proper division of work between teacher and class. 7. Motivation and self-direction of drill. By these practice tests the author believes that "standard speed and accuracy will be attained by each child in a class at a minimum cost in the time and effort on the part of both teacher and children." This is a noteworthy attempt to utilize the results of scientific investigation in schoolroom drill, and will be closely followed by both the scientific student of education and the practical schoolman.

The Illinois Association of Teachers of English has been carrying on under the direction of a committee, of which Professor John M. Clapp of Lake Forest College is chairman, an interesting co-opera-

tive experiment on the relative values of oral and written composition. One group of high schools gave the pupils (second term freshmen) written exercises only, while another group gave a combination of two-thirds oral and one-third written work. At the beginning of the semester, at the middle and at the end all pupils were given the same written tests, and the results, together with a detailed account of the conditions surrounding the work, were reported to a central committee. The results were strongly in favor of greater emphasis on oral work, and the committee recommends that oral composition be made a regular part of the high school English work throughout the four years. A more detailed account of the experiment may be found in the bulletins of the Association, volume V, numbers 1 and 4.

The Louisiana State Teachers' Association has recently issued in pamphlet form the report of its Committee on Educational Research. This committee, whose chairman is Dr. David Spence Hill, Director of Educational Research in New Orleans, outlines a series of investigations which might profitably be conducted by members of the Association, either individually or collectively. Among the studies suggested are a tabulation of the occupations which boys have actually entered on leaving school, a determination of the exact number of children that leave school from each grade each year, a determination of the actual amount of repeating in each grade of each school, a study of the amount and degree of mental retardation among children of school age, experimental studies to determine the best methods of presenting school subjects, moral and vocational education for negroes and a study of the literature and trend of opinion on the teaching of sex hygiene in the schools. On the latter topic the committee makes several definite recommendations, and takes on the whole a decidedly conservative stand.

Dr. J. E. Wallace Wallin, who since the winter of 1912 has occupied the position of professor of clinical psychology and director of the psycho-educational clinic in the School of Education of the University of Pittsburgh, has been appointed to the position of Director of the Psycho-Educational Clinic in the St. Louis public schools. The clinic will be organized at the beginning of the next school year. It will be located on the grounds of the Harris Teach-

ers' College, with which institution it will be closely affiliated. Lecture courses on abnormal children by the director will be offered in the extension division of the college. Students may matriculate in these courses whether or not they reside in the city of St. Louis. The clinic will be organized as an independent bureau in the educational division of the schools, not as a minor division of the department of school hygiene or medical inspection, but it will work in close co-operation with the latter department. The clinic will exercise administrative control under the regulations of the superintendent's office over the examination, classification, education, placing and transfer of the mentally exceptional children in the public schools. The actual supervision of the work in the special classes will be done by a special supervisor, working under the directions of the clinic. St. Louis has already segregated about 500 pupils in special classes, and it is expected that the number will now rapidly be increased to at least 1000. Each child will be given a psychological, sociological, pedagogical, hereditary and medical examination. It is expected that a staff of assistants commensurate with the growing needs of the clinic will gradually be organized, and that, eventually, the clinic organization will include a bureau of vocational guidance. The clinic aims to serve as an educational, social and vocational clearing-house for the community. The St. Louis authorities have carefully studied the situation, and believe they have effected the best form of organization, linking the clinic, on the one hand, with the training school for teachers, and, on the other hand, making it an integral part of the educational division, with supervisory control of the special classes. Dr. Wallin will continue his work at the University of Pittsburgh until the end of the summer term.

The colony system for mental defectives is proving itself increasingly successful in New Jersey. Unimproved land is purchased at a reasonable price, and a colony of mental defectives is established upon it. Many of these unfortunates can do productive work under careful supervision, and are utilized to clear the land and bring it under cultivation. It can then be sold to normal farmers at a good price and the process repeated. So long as these colonies are kept free from commercialism and are managed strictly in the interests of the defectives, the plan seems to be an excellent one for enabling them to become at least partially self-supporting.

Under the direction of the department of education arrangements have been made to open a pedagogical clinic at the University of Texas next September. Two groups of freshmen will be selected, one from the best, the other from the poorest students in the class, and intensive studies will be made of the learning and other abilities of individual students. Not only will the ordinary physical and mental tests be used, bút an attempt will be made to obtain a complete record of the family history, the early family life and the elementary and secondary school activities and interests. Tests in high school and college subjects will be devised and applied, and the student's time schedule and methods of work will be subjected to careful scrutiny. It is hoped that in this way material may be collected which will make possible a more careful diagnosis of the individual student's needs, and that on the basis of such a diagnosis the instructors may be able to adjust their work more intelligently to the capacities of the students.

The Minnesota State Department of Education has recently issued a report of the committee on elementary course of study of the Minnesota Educational Association, dealing with elimination of subject-matter in arithmetic, American history, composition, English grammar, geography and reading. The report was prepared on the basis of a questionnaire to the members of the Association, and is interesting in that it indicates in brief compass not only what should be excluded, but also what should be included. There are many valuable practical suggestions on the teaching of the subjects discussed. Strangely enough, the subject which is in the most chaotic condition in respect to aims and methods of teaching is reading.

The Berlin Psychological Association has offered a prize of 750 marks for the best treatise on "The Relation Between the Intellectual and Moral Development of the Youth."

Dr. George A. Works has been elected professor of rural education in the college of agriculture at Cornell University.

Dr. Gertrude Kam, demonstrator in psychology at Bryn Mawr College, has been made an associate.

PUBLICATIONS RECEIVED.

(Notice in this section does not preclude a more extended review.)

LEONARD P. AYRES. *Constant and Variable Occupations and Their Bearing on Problems of Vocational Education.* New York: Russell Sage Foundation, 1914. Pp. 11. Five cents.

A tabulation of the number of men and women workers per 10,000 of population in each of the most important occupations, as found in cities of over 50,000 population. The numbers in the lowest, median and highest cities are given.

GARDNER CHENEY BASSET. *Habit Formation in a Strain of Albino Rats of Less than Normal Brain Weight.* Behavior Monographs, Vol. 2, No. 4, 1914. P. 46. 65 cents.

Experiments were carried on for two years upon 62 normal and 62 inbred rats of less than normal brain weight to determine the relative learning ability as tested by a maze and two inclined plane tests. The final conclusion is: "A less than normal brain weight in a strain of rats is accompanied by a less than normal ability to form habits."

RICHARD C. CABOT, M.D. *What Men Live By: Work, Play, Love and Worship.* Boston: Houghton Mifflin Company, 1914. Pp. xxi, 336. $1.50 net.

This book is the result of a skilful and sagacious physician's reflections upon three important problems, "What is the best way to care for the tuberculous? How can nervous people be restored to balance and happiness? Where can we find help that is worth offering to a girl facing motherhood without a husband?" Impressed by the temporary nature of the relief afforded by institutional treatment, he is thrown back upon "real life" as the ultimate curative prescription, and an analysis of the essential features of his medicine leads him to the four fundamental activities mentioned in the title. The author, writing with the background of a wide and successful experience in the field of medicine, with extended training and much reflection in philosophy and ethics, and animated by a warm sympathy with the needs of his fellows, has produced one of the noteworthy books of the year.

EDWARD CLODD. *The Childhood of the World.* New York: The Macmillan Company, 1914. Pp. xiii, 240. $1.25 net.

An attempt "to narrate, in as simple language as the subject will permit, the story of man's progress from the unknown time of his appearance upon the earth, to the period from which writers of history ordinarily begin." The book was first issued forty-two years ago, and, as the demand for it still continues, the author decided to rewrite it entirely and to bring it up abreast of the progress in modern science. Part I deals with man the worker, sketches his place in nature, his primitive wants, and the important steps he has taken in satisfying those wants. Part II discusses man the thinker, and outlines the progress of his reflections about natural phenomena and his relations to the world about him. Especial stress is laid on the evolution of religious observances. Part III considers man the discoverer and inventor, and traces the development of modern science. The book is to be commended to young people for its simple style, and for the broad sweep of its subject matter.

The Education of Karl Witte, or the Training of the Child. Edited, with an Introduction, by H. Addington Bruce. Translated from the German by Leo Wiener. New York: Thomas Y. Crowell & Company, 1914. Pp. xl, 312. $1.50 net.

To what extent is a man's future influenced by his early training? Recent studies of heredity *versus* environment seem to point clearly to a preponderance of the heredity factor, and make us question the significance of early training. In the present book we have an account of a child whose early development and subsequent distinguished career was due (in his father's opinion at least) chiefly to the method of his early education. But even if this is true, perhaps it is not so wonderful when we reflect that for twelve years his father (a man of excellent education and penetrating insight) devoted practically every moment of his waking hours to the boy's training. Although the book was written nearly a hundred years ago, the narrative turns upon a problem that is vital at the present moment, *viz.*, are we accomplishing all that might be done in the early education of our children?

EDWARD C. ELLIOTT. *City School Supervision.* Yonkers-on-Hudson: World Book Company, 1914. Pp. xiv, 258. $1.25 net.

This most recent number of the School Efficiency Series, edited by Prof. Paul H. Hanus, presents the results of the investigation of the New York City superintendent, the associate superintendents, the district superintendents, the board of examiners, and the directors of special branches. There are also chapters on methods and standards for determining teaching efficiency, and on rating of teaching

efficiency in other cities. It is a mistake to think that these volumes apply only to conditions in New York City. They constitute a valuable series of discussions of public school policy, and are constructive contributions to the subject of school organization.

HELGA ENG. *Abstrakte Begriffe im Sprechen und Denken des Kindes.* Beihefte zur Zeitschrift für angewandte Psychologie, No. 8. Leipzig: J. A. Barth, 1914. Pp. iv, 116. M. 3.60.

The author took as her problem, What effect has an abstract conception upon a child's thinking as a starting point for a train of thought? She studied the rate of association, the type of response, and the relation of the concept to the remainder of the thought. There were thirty subjects between ten and one-half and fourteen years of age. The rate of response to abstract terms is on the average twice that to concrete terms, and decreases with increasing age. Frequently there was no response whatever to the abstract term, seldom was this the case with a concrete term. The monograph contains a discussion of the genetic psychology of abstraction and a good working bibliography.

FREDERIC ERNEST FARRINGTON. *Commercial Education in Germany.* New York: The Macmillan Company, 1914. Pp. xi, 258. $1.10.

In the past half century Germany has undergone a striking transformation from a predominantly agricultural mode of living to an industrial and commercial life. The reasons for this transformation are primarily economic, but education has had its share in contributing to the efficiency and success of the new lines of activity. The present book sets forth the organized agencies in the German educational system for the development of efficient commercial factors. The data were gained by a first-hand study of the schools discussed, and give a faithful picture of German commercial education.

L. M. GILBRETH. *The Psychology of Management.* New York: Sturgis & Walton, 1914. Pp. 344. $2 net.

The sub-title of this book is "The Function of the Mind in Determining, Teaching and Installing Methods of Least Waste," which leads one to suspect that the author's psychology is of a somewhat superficial type. Casual inspection of the book strengthens this impression. There are numerous references to a few of the simpler and more elementary textbooks, but the author seems to have no inkling of recent work in individual psychology, mental tests or scientific studies of industrial behavior. On the other hand, the book gives one an excellent idea of the attitude of so-called specialists in scientific management toward the problems of industry, contains valuable references to discussions in industrial literature, and suggests many problems to the psychologist for experimental investigation.

J. S. HALDANE. *Mechanism, Life and Personality.* New York: E. P. Dutton & Co., 1914. Pp. vii, 139. $1 net.

Perhaps even the most scientifically minded scientist has something of the mystic in him, and this is apt to reveal itself when he begins to attack and try to answer ultimate questions. The author, who is an eminent physiologist, first shows the utter inadequacy of vitalism, reviews the mechanistic hypothesis and rejects it as unsatisfactory, finally falls back upon the philosophical views of Hume and Kant, and finds his ultimate reality in personality—and a decidedly mystical conception of personality it is. It is true that the ultimate problem of life is far from solved, but it is certainly better to keep on trying to solve it along rational lines than to plunge into the billowy clouds of mysticism.

BERNARD HART, M.D. *The Psychology of Insanity.* Cambridge, Eng.; at the University Press. New York: G. P. Putnam's Sons, 1912. Pp. 176. 40 cents.

This is one of the volumes of the Cambridge Manuals of Science and Literature. The author can make, of course, no comprehensive survey of his field within the brief limits of such a small handbook prepared for lay readers. He has contented himself, therefore, with selecting certain phases of the subject and seeking to show how a number of psychological principles are operative within these phases. The principles are mainly Freudian, although Dr. Hart does not subscribe *in toto* to Freud's system. The treatment centers about such concepts as dissociation, complexes, conflict, repression and projection.

H. L. HOLLINGWORTH. *Experimental Studies in Judgment.* Archives of Psychology, No. 29, December, 1913. Pp. 119. $1.25.

A series of studies of the basis or perceptual criteria of typical judgments, the laws or behavior of judgments, and the ways in which the laws are modified or the behavior conditioned by specific variations of the judgment situation. The ten studies deal with judgments of personal efficiency, the central tendency of judgment, the direction of judgment, habitual tendencies of judgment, judgments of similarity and difference, influence of form and category on the outcome of judgment, judgments of extent of movement, and judgments of evaluation.

MORRIS JASTROW, JR. *Hebrew and Babylonian Traditions.* New York: Charles Scribner's Sons, 1914. Pp. xvii, 376. $2.50 net.

One of the most fascinating and fruitful fields of genetic social psychology is that of the ancient myths, traditions and religious beliefs of early civilizations. The researches of the past few years

have thrown a flood of light upon the ideas and activities of the early civilizations of Western Asia, and enable us to appreciate and understand better the Hebrew and Greek traditions that have had such a profound influence upon our own thought. The present book sets forth in charming manner and with a delightfully lucid and flowing style the results of the most recent investigations in Babylonian culture, and draws very clearly the parallel between the Babylonian and Hebrew traditions. The five chapters discuss the general relations between the Hebrews and the Babylonians, their respective accounts of the creation, their customs regarding the observance of the Sabbath, their views of life after death, and their ethical ideas. An appendix gives the Hebrew and Babylonian accounts of the Deluge. The book teems with facts that are of great interest to the social psychologist.

VERNON LEE. *The Beautiful: An Introduction to Psychological Aesthetics.* New York: G. P. Putnam's Sons, 1913. Pp. 158. 40 cents.

The object of this little volume is to present an analysis, couched in terms intelligible to the lay reader, of the mental processes in operation in the appreciation of beauty, with special reference to the perception of visible forms. It "makes no attempt to 'form the taste' of the public and still less to direct the doings of the artist." The psychologist will not find Mr. Lee's treatment devoid of interest, while those not versed in psychological aesthetics will find here a very helpful introduction to the subject.

MARION J. MAYO. *The Mental Capacity of the American Negro.* Archives of Psychology, No. 28, November, 1913. Pp. 70. 60 cents.

A more descriptive title for this monograph would be "The School Attainments of Negro Pupils." After a preliminary chapter on the measurement of racial mental differences, the author makes a comparative study of the negro and white pupils in New York City high schools, showing that negroes are from seven to nine months older on entering school, that they remain seven-tenths of a term longer than white pupils, that their average grades are four per cent. lower than corresponding classes of whites, and that their percentage of failures is larger in each term of the high school course. There are elaborate tables showing the standing of white and colored pupils by subjects. "Whether measured by teachers' marks, or by mental tests, or by their distribution through the grades by ages or per cents., the relatively slow progress of the colored pupils seems to be the constant result."

CHARLES S. MYERS. *An Introduction to Experimental Psychology.* Cambridge, England: University Press. New York: G. P. Putnam's Sons, 1912. Pp. vii, 156. 40 cents.

This volume of the Cambridge Manuals of Science and Literature contains chapters on color vision, the dermal senses, the Müller-Lyer illusion, experimental aesthetics, memory, and two chapters on mental tests and their uses.

W. P. PYCRAFT. *The Courtship of Animals.* New York: Henry Holt & Co., 1914. Pp. xvi, 318. $1.75 net.

There are some indications that man is becoming an increasingly reflective animal, and the eugenics movement, including the campaign for sex enlightenment in the home and in the school, points to the removal of even so fundamental an impulse as the propagation of the race from the realm of blind instinct to that of conscious forethought. A full understanding of the sex impulse can be gained only by studying it genetically, and in this volume the author has sought to bring together the observations of biological scientists on the love making of animals. The behavior and secondary sexual characters of apes, the lower mammals, birds, amphibia, fishes, butterflies, moths, grasshoppers, spiders, crabs and bees are discussed in order. There is perhaps a tendency to give an unduly anthropomorphic interpretation to some of the behavior.

BENOY KUMAR SARKAR. *Introduction to the Science of Education.* New York: Longmans, Green & Co., 1913. Pp. 141. $1.10 net.

The author, who is a member of the National Council of Education in Bengal, is a prolific writer, and seems destined to become a leader in the movement for modernizing the educational system of India. The title, however, is misleading. There is nothing in the book about the science of education as the term is used in current discussions, but the author makes a plea for a study of the natural sciences in place of philosophical interpretations of the sacred books, such as have heretofore dominated Indian education.

W. WARREN SHAW. *The Lost Vocal Art and its Restoration.* Philadelphia: J. B. Lippincott, 1914. Pp. 219.

This book "has for its purpose the restoration of the vital principle in systems or methods of voice culture which formerly characterized the Old Italian Method. The science of psychology is shown to be the real science on which the old school actually stood, and on which all really successful schools of voice culture must stand." A casual glance at its pages, however, reveals how little the author knows of scientific psychology. The main argument is a protest against undue emphasis on physiology in the teaching of singing, and

this position is undoubtedly well taken. Singing is attained by attention to the proper production of good tones, not by physiological analysis of the mechanism by which tones are produced. There is a commendatory introduction by David Bispham.

R. W. Stimson. *The Massachusetts Home-Project Plan of Vocational Agricultural Education.* Bulletin 579. Washington: Bureau of Education, 1914. Pp. 104.

An interesting plan to unite more intimately the school and the home in giving young people practical training in agriculture. There is a valuable bibliography of 880 numbers.

Charles Keen Taylor. *Character Development, a Practical Graded School Course.* Philadelphia: The John C. Winston Co., 1913. Pp. 241. $1 net.

A series of lessons for each age from six to fourteen, correlating general morals, citizenship, domestic science, physical training, vocational guidance and recreation. The method of instruction is that of story telling with supplementary talks to and with the children to carry home the essentials of good conduct. The final chapters discuss children's reading and the health of the child, and the book is provided with preface by Prof. Arthur Holmes. The scheme outlined is the result of extended experimentation in the schools of Philadelphia, and gives promise of great usefulness with wider application.

Training School for Public Service. Annual Report, 1913. New York: Bureau of Municipal Research, 1914. Pp. 56.

A statement of the purposes of the school, an outline of field training, a presentation of the need for trained men in various municipal activities, a discussion of typical assignments, and a list of the members of the Training School.

Thorstein Veblen. *The Instinct of Workmanship and the State of the Industrial Arts.* New York: The Macmillan Company, 1914. Pp. ix, 355. $1.50 net.

Students of animal behavior will recall the importance which Loeb attributed to the discussion of the instinct of workanship in Veblen's earlier book, "The Theory of the Leisure Class." The present book is a masterly study of the development of the technical arts, and of the social relationships which accompanied that development. It shows the author's familiarity with recent studies in animal behavior, with psychological studies on the nature of instinct and with contributions to anthropology and economics, and presents a closely reasoned, well-knit exposition of the factors and tendencies

that play the larger part in our modern civilization. The seven chapters discuss the general significance of instinct, contamination of instincts in primitive technology, the savage state of the industrial arts, the technology of the predatory culture, ownership and the competitive system, the era of handicraft, and the machine industry. It is one of the most acute and thoughtful studies of social forces in recent years.

HOWARD C. WARREN. *The Mental and the Physical.* Reprinted from the Psychological Review, Vol. XXI, No. 2, March, 1914. Pp. 79-100.

In this presidential address before the American Psychological Association the author defends the double-aspect view of the relation between mind and matter, and likens it to the relation between surface and mass in our perception of material phenomena.

LOUIS N. WILSON. *G. Stanley Hall, A Sketch.* New York: G. E. Stechert & Co., 1914. Pp. 144. $1.25 net.

It will be a boon to the many admirers of G. Stanley Hall to have this sketch of his life and the bibliography of his writings. His publications at the time this monograph went to press had reached 338 numbers. Dr. Hall was the pioneer in child study and educational psychology in America, and the influence of Clark University upon the trend of educational thought in the past quarter century has been of the greatest moment. Educated for the ministry, for six years professor of English, and with six years of contact with a remarkably large number of the most eminent scientific men in Germany, it is not strange that Dr. Hall's psychological work has been as broad as the whole field of human endeavor. The world of scholarship will be the richer for this sketch of a great scholar.

W. T. YOUNG, M.A. *Introduction to the Study of English Literature from the Earliest Times to the Close of the Victorian Age.* New York: G. P. Putnam's Sons, 1914. P. 238. 75 cents.

The author offers the book as a "companion to studies, not as a short cut to a superficial and specious knowledge of the classics of our language," and holds that "literature is, rightly, a pursuit in which the faculties are liberated and disciplined by the freshness and variety of imaginative experience, and are made strong and supple so that they learn to enjoy the pleasure of their own activity" —perhaps as characteristic a statement of formal discipline as one could wish.